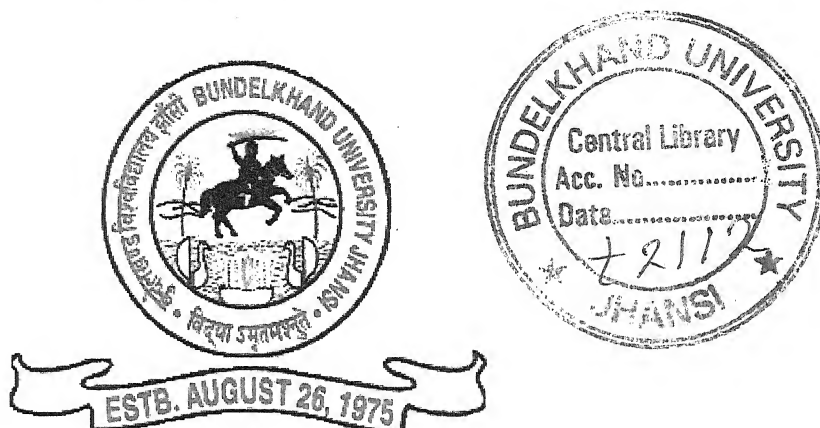


AVAILABILITY AND USE OF PERIODICALS IN THE FIELD
OF PHYSICAL SCIENCES IN UNIVERSITY OF DELHI AND
JAWAHARLAL NEHRU UNIVERSITY LIBRARY:
A COMPARATIVE STUDY



Thesis Submitted for the Award of the Degree of

DOCTOR OF PHILOSOPHY

IN

LIBRARY AND INFORMATION SCIENCE

By

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Under the Supervision of

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BUNDELKHAND UNIVERSITY, JHANSI (U.P.)**

2005

Dedicated

To

My Loving

Parents

Prof. M.T.M Khan,
Head,
Deptt. Of Library & Inf. Sc.
&
Dean, Faculty of Arts,
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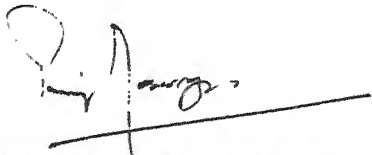


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CERTIFICATE

This is to certify that the work embodied in the thesis entitled
*"Availability and Use of Periodicals in the Field of Physical Sciences In
University Of Delhi And Jawaharlal Nehru University Library: A
Comparative Study"* is submitted by Mahender Pratap Singh, Lecturer,
Department of Library and Information Science, for the award of the
degree of Doctor of Philosophy in Library and Information Science. It is
a record of the bonafide research work carried out by him under my
supervision and guidance. This work has not been submitted
elsewhere for a degree/diploma in any form.

It is further certified that he has worked with me for the period
required under the Ph.D. Degree, Ordinance-7 of the Bundelkhand
University, Jhansi.

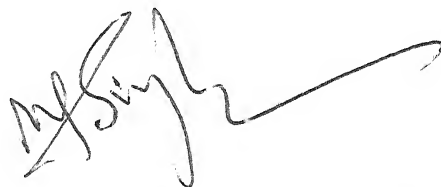

(Prof. M.T.M.Khan)

DECLARATION

I hereby declare that the thesis entitled "*Availability and Use of Periodicals in the Field of Physical Sciences In University Of Delhi And Jawaharlal Nehru University Library: A Comparative Study*" submitted to the Bundelkhand University, Jhansi, has not previously formed the basis for the award of any degree/diploma or other similar title or recognition. This work embodies the results of my original research and reflects advancement in this area.

Date 21-01-2006

Place Jhansi



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PREFACE

Knowledge has grown over the years from past to the present day. We are living today in an age, which is called the age of knowledge explosion. This is an age when man's interest lays in the narrower, most minute subjects, which are, studied in relation to one another. This has given birth to numerous amount of research is being carried out in different fields of knowledge throughout the world today. Science and Technology are the forerunners in the knowledge race. The development in the field of social science owes a lot to scientific discoveries and technical advancement because they have influenced the whole society. The astounding progress in the research and development programmed would never have been possible if the communication gap was not eliminated by the periodicals.

Science communication has now reached a stage where in ideas, developments and achievements in scientific and related fields are transmitted through communication satellites and computers, knocking out thereby the conventional modes of information transfer. Yet, when the question of communicating the results of concentrated research arises. Written words occupy an unchallengeable place. Among the various means of as it is the only form through which have emerged or are emerging new vistas of knowledge.

This is the Golden age of periodicals. Nothing can be done without them. Research institutions, associations, and organizations. Sects. and Parties. Benevolent societies and even individuals, all have their periodicals. Science and literature, religion and law, agriculture & arts, resort alike to this mode of enlightening the public mind periodicals, a source of current information, have become indispensable these days, because through these, the result of research in different parts of the world are communicated. They are the vehicles of the nascent thought.

Sometimes, due to the shortage of space and rising costs, many libraries face problems in the handling of periodicals. A library must decide, which periodical titles could be cancelled, which could be converted to microform.

journals of all types should be accorded equal status, and they have to be ranked on the basis of use, and so on.

Though many use studies have been done abroad but results of these studies cannot be generalized for application in Indian libraries on account of: Different thrust areas of research; Lack of advanced technology; Different reading habits of scientists; Different educational, research and physical facilities in Indian Libraries. Studies undertaken so far in India lack a broad coverage. In short the detailed use studies are need of the day to enable the libraries to build up balanced and optimally used collection with limited financial resources.

Present study is an attempt to study and compare 'use' of 'periodicals' by scientists in both selected University libraries in Delhi in Physics, Chemistry and Math's. The use has been studied which the help of five indicators viz; citations, In-library use, Photocopy Use, Inter-Library Loan Use, and Assessed use. In addition, data about libraries and user's opinion has been collected by canvassing questionnaires to librarians of different libraries under study, and users i.e. scientists.

The study is confined to both selected university libraries in Delhi selected on the basis of parameters like document collection specialization, size of collection, number of scientific periodicals acquired, library membership, library budget and the year of establishment of the library. The libraries selected are: Central Science Library (DU) and Jawaharlal Nehru University Library (JNU).

Periodicals of research nature, in English language in printed as well as non printed form (on line journal, E-journal and so on.) in Physics, Chemistry and math's, having frequency of less than a year have been covered in the study. Indexing and Abstracting periodicals have not been covered in the study as these serve as location tools.

Some of the important objective of the study, are: Identification of use pattern of periodicals in the subjects under study; Identification of core periodicals; Comparison of the total use of periodicals in Physics, Chemistry and Math's in both university libraries covered in the study; Identification of periodicals used most frequently; and study of the 'obsolescence' and 'half life' in the libraries under study.

The study is based on hypotheses given in chapter-1 and these have been tested ^{collected} with the help of the data and proved.

The study has been divided in to five chapters and contains with 10 appendices and a bibliography. The details are as under:

Chapter 1: The study - Its Need, Scope, Objectives and Hypotheses besides giving details on these aspects it also lists limitations of the study.

Chapter 2: Review of Literature highlights few important earlier studies on the subject under investigation and examines the methodology used and gives their significant findings.

Chapter 3: Research Design and Methodology discusses the conceptualized plan for the conduct of the study and discusses the methodology used for the study. The methods of study discussed are: survey method, questionnaire as well as interview techniques used in the present study to collect data from librarians and scientists i.e. users of respective libraries. Further, the indicators used for data collection viz: Citation, In-Library Use, Photocopy Use, Inter Library Loan Use have also been discussed.

Chapter 4: Data Collection and Analysis has been divided into three parts 4A, 4B, and 4C. In Part 4A analysis of data collected through questionnaire administered to librarians of both university libraries has been done. Part 4B has been further subdivided in to four parts i.e. BA, BB, BC and BD. Part BA - BC deal with data collected on the basis of questionnaire

administered to user scientists in Physics, Chemistry and Math's, whereas BD deals with comparison. In part 4C analysis of data collected on five indicators has been done and compared as well.

Chapter 5: Findings, Suggestions and Areas of Further Research

deals with major findings as an outcome of the study. It gives suggestions emerging as a result of study and also suggests areas of further research.

The study contains 10 appendices and a bibliography.

Some of the important findings of the study are: physical facilities in both selected University Libraries in Delhi are satisfactory and are helpful in use of periodicals. A large percentage of scientists have found the available periodicals collection in their both university libraries as 'most useful' or 'useful'. However, the need to subscribe to more periodicals has also been indicated in a varying degree by scientists.

The study also reveals that ranking based on use of a periodical differs from both libraries. Therefore, the acquisition, discarding or discontinuing policies. Should not be based on surveys conducted for other libraries. Further, use studies done by one indicator cannot be taken as a valid guide to take any policy decision on subscription to periodicals.

Scientists have identified periodicals as most useful category of document and they prefer to use periodicals in printed as well as non-print form and in English language. An important finding is that about half the subscription lists provides around 90% need based use of periodicals and only 15% to 18% periodicals acquired higher frequency of use (i.e. above 26 and more frequencies of total use). The study has, further found that with the decrease in number of participating libraries the number of periodicals having common use increases. In both selected University libraries in Delhi the half-life of periodicals on an average in Physics is 6 years, 5.4 in chemistry and 4.8 in math's, whereas, obsolescence is 16.6 years in Physics, 13 years in Chemistry

and 12 years in math's. Periodicals published from USA occupy highest rank in contributing to maximum percentage of use in all the three subjects followed by UK, India and Netherlands and other countries in Physics and Chemistry, whereas, in Math's India occupies second rank followed by UK and Netherlands.

ACKNOWLEDGEMENT

I find it difficult to suitably express my deepest sense of gratitude to almighty for the completion of my research work in time.

At the outset, I take this opportunity to express my deep and profound sense of gratitude towards my esteemed supervisor, **Prof. M.T.M. Khan**, Dean, Faculty of Arts, Head and a renowned teacher in the Department of Library and Information Science, Bundelkhand University Jhansi. Words would be inadequate to express my indebtedness, but my heart overflows with profound sense of gratitude, without whose cooperation, invaluable guidance and blessings, the present piece of research would not have been completed. In fact, it is a matter of privilege to have worked with him and draw upon his rich experience, expertise and scholarly advice.

My sincere thanks are due to the authorities of Bundelkhand University, Jhansi for very kindly giving me an opportunity to work on the topic and also providing me an environment conducive for such work.

The present work covers the survey of two selected university libraries in Delhi, besides count of uses on different indicators in three subjects. In a work like this the help of librarians, library staff and scientists in each of the subject field cannot be overlooked. It is difficult to mention all those names, which have rendered their invaluable help by giving their precious time and required data for the conduct of this study. I wish to record my thanks to all of them.

My sincere thanks are due to **Dr. Muttayya Koganuramath**, University Librarian, Jawaharlal Nehru University Library, for his

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While cherishing the friendly association of all my teaching and non-teaching colleagues in my department, I would like to thank them all.

This research work has been possible due to the blessings and guidance of my teachers and all my well wishers whose name could not be included but are fondly remembered.

My special thanks are due to all the faculty members of '**Libra Study Point**' for their continuous encouragement and for providing necessary facilities.

Words are not sufficed to express my thanks to my younger brother **Harpal Singh**, Senior Accounts Officer, Indian Oil Company. He always encouraged me by saying "Life does not depend on doing extraordinary things, but in doing ordinary things ⁱⁿ extra ordinary way".

Lastly, I don't know, in what terms I can acknowledge the constant inspiration so kindly and lovingly given by my beloved **Parents, Sisters** and **Brothers** without which the research work would have not seen the light of the day.



(Mahender Pratap Singh)

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ABBREVIATIONS USED

AIP	American Institute of Physics
APINMAP	Asia and Pacific Information Network on Medicinal and Aromatic Plants
ASLIB	Association of Special Libraries and Information Bureau
AU	Assessed Use
Avg.	Average
BIS	Bureau of Indian Standard
C%U	Cumulative Percentage Use
CD-ROM	Compact Disk Read Only Memory
CSIR	Council of Scientific and Industrial Research
CSL (DU)	Central Science Library, (University of Delhi)
CU	Citation Use
DELNET	Delhi Libraries Network
DESIDOC	Defence Scientific Information and Documentation Center
DU	University of Delhi
I/A	Indexing/ Abstracting
IASLIC	Indian Association of Special Libraries and Information Center
ICSU	International Council of Scientific Union
ILL	Inter Library Loan
INF	Information
INFLIBNET	Information and Library Network

INSA	Indian National Science Academy
ISCA	Indian Science Congress Association
ISI	Indian Standards Institute now Bureau of Indian Standards
IU	In- Library Use
JCR	Journal Citation Report
JNU	Jawaharlal Nehru University
LU	Loan Use
MAPA	Medicinal and Aromatic Plant Abstracts
MIT	Massachusetts Institute of Technology
NISI	National Institute of Science in India
NISCAIR	National Institute of Science Communication and Information Resources
NLL	National Lending Library
NML	National Medical Library
No.	Number
NSL	National Science Library
Pls	Periodicals
PU	Photocopy Use
SES	School of Environmental Sciences
SIRNET	Scientific and Industrial Research Network
SLS	School of Life Sciences
SPS	School of Physical Sciences
SSPL	Solid State Physical Laboratory
%U	Percentage Use
UGC	University Grants Commission

UNESCO	United Nations Educational, Scientific and Cultural Organization
UK	United Kingdom
US	United States

CHAPTER 1

THE STUDY: ITS NEED, SCOPE, OBJECTIVES AND HYPOTHESES

1 INTRODUCTION

Human society cannot be considered as complete today without scientific activity of some kind or other. Scientific research has revolutionized the life of modern man. The result of this evolutionary scientific activity is an enormous growth of scientific literature since today the scientists are eager in spreading the results of their investigations far and wide.

As Derek De Solla Price says, "there is in the field of science a cumulative acceleration of contribution that resembles a pile of bricks. Each researcher adds his bricks to the pile in an orderly sequence that is in theory at least to remain in perpetuity as an intellectual edifice built by skill and artifice resting on primitive foundations and stretching to the upper limits of the growing research front of knowledge.

As Englel says, "as a result of the headlong growth of science and technological research in recent years, scientists are being troubled increasingly by a bizarre nightmare. One day, so the nightmare goes, science will gas to a Holt, drowned in the sea of its own mounting knowledge."

Science communication has now reached a stage where in ideas, developments and achievements in scientific and related fields are transmitted through communication satellites and computers, knocking our thereby the conventional modes of information transfer. Yet, when the question of communicating the results of concentrated research arises, written words occupy an unchangeable place. Among the various means of written communication, a periodical occupies a pivotal position, as it is the only form through which have emerged or are emerging new vistas of knowledge.

Modern Libraries serve as an interface between the consumer of information and the world's recorded knowledge. Given this role, libraries' goal is to maximize the accessibility of published material to its users. The problem of meeting this challenge has been further aggravated by the fast expanding boundaries of knowledge and proliferation in publishing, which has made it difficult for the libraries to meet the information needs of its specialist users. This problem is more acute in University libraries where emergence of new researches and new investigations and their application is enriching the knowledge at a very fast rate.

Scientists have always needed and demanded information relevant to their research, such as: the methods used to study the problems under investigation, research results, what other researchers in the related field have recently completed or are presently doing, and what is being done in a broader and narrower areas of their interest as well. This type of information usually includes all documents that present new ideas and research findings. These can take the form of Physical Science periodical, patents, technical reports, conference proceedings, theses, and so on.

The libraries in general, and their periodicals section in particular are facing problems like literature explosion and consequent information explosion i.e. increase in number of periodical publication as well as articles published in them, rising price, continuous shift in thrust areas of research, and inter-disciplinary research. In a country like India the situation has become more acute with the inflation (devaluation of Indian rupee) and fluctuation in exchange/conversion rates, static or disproportionate library book budget, and increasing number of user scientists.

Current periodicals are the source of new information, which is not generally available in other sources. These are the basic source of publication of new inventions, theories, trends and view points, which otherwise would take years to appear in the sources like books. This can even lead to super cession of inventions and discoveries by advanced research. Periodicals have thus become

the life blood of scientists despite their high costs and the problems involved in their acquisition, handling, storage and retrieval of information.

2

THE NEED FOR STUDY

The libraries in general, and their periodicals section in particular are facing problems like literature explosion and consequent information explosion i.e. increase in number of periodical publication as well as articles published in them, rising price, continuous shift in thrust areas of research, and interdisciplinary research. In a country like India the situation has become more acute with the inflation (devaluation of Indian rupee) and fluctuation in exchange/ conversion rates, static or disproportionate library book budget and increasing number of user scientists.

The need, therefore, for optimum utilization of periodical and maintenance of a manageable yet relevant collection becomes more acute than ever before. In order to have the optimum use of limited resources and communicate the available published knowledge, there is a need to relate the acquisition of periodicals to their use and a use survey is the most effective means of evaluating as well as developing the library periodicals collection of a library. This need is most obvious in country like India and present study is an attempt in this direction.

The importance of such surveys has been pointed out by many. Matarazzo²³ who studied corporate library closure found that lack of evaluation of library collection and services was as an important factor responsible for the closure of library. Coover stresses on the determination of the users' need and Bare states, "periodically, it is necessary to canvass the user population of a special library to determine whether the objectives of library are being met".

2.1 GROWTH OF PERIODICALS

The first periodical was probably published in France as a critical journal, the Journal des Scavans (later journal des savants): The historian Mezery originated the idea in 1663, his proposal being to establish a weekly journal in which should be printed happenings in the world of letters. The idea was carried out by Denis de sallo, who began the journal des Scavans on January 5, 1665. Periodicals were springing up elsewhere in Europe at this time, the first in England appearing in 1680. Certain early titles included Acta philosophica - 1665, Acta Enditorum Germany 1682.

In 1704, Daniel Defoe began the Review of the Affairs of Frances and All Europe as influenced by that Nation.

In 19th century, no. of magazines increased steadily in 19th century. The name "magazines" lost much of its original significance and its place being taken by other terms such as "journal" or "review".

Throughout the 18th and 19th centuries, the spread of specialized journals continued in to the developing fields of science. By the middle of the 19th century over one thousand scientific and technical periodicals are being published throughout the world.

The credit for starting a periodical in the field of pure sciences in India goes to the Asiatic Society, Calcutta. It started issuing the first quarterly journals in 1834. Before the year 1900, only 6 periodicals were started in pure Sciences. Between 1900-1950 there was not much activity in the field of periodical publications in pure sciences. Altogether only 53 new periodicals were started in this long span of 50 years. But in the span of 13 years, in the period 1951-1964, this number has more than doubled. Sixty-six new periodicals were started in this period taking the total number of periodicals 122. On an average 5 periodicals were started per year in this period. In the period 1969-1976, the number of periodicals increased tremendously and the

total number reached to 262, with the addition of 107 periodicals in the span of years.

Scientific periodicals provide a platform for the communication of ideas, the exchange of scientific experiences and transmission of day-to-day developments in the field of science and technology.

According to Alfred D Keator, periodicals deal with "nearly every conceivable subject, ranging from asbestos to nut culture, rifle shooting to roadside selling, counterfeit money to so-called 'matrimonial'".

The periodicals serve as a link between the newspaper and the book. Periodical is an important literary document for the libraries. And it is more important for the libraries to collect and store the files of periodicals.

**TABLE 1.1: GROWTH IN NUMBER OF PERIODICALS IN
SCIENTIFIC DURING 1800 - 2005.**

S.No.	Period	No. of Periodicals
1.	1800	100
2.	1900	5,000
3.	1920	25,000
4.	1934	35,000
5.	1953	50,000
6.	1965	75,000
7.	1975	1,00,000
8.	1985	1,30,000
9.	1995	1,65,000
10.	2005	2,05,500

Thus, we see that in the beginning of 19th century, the number of periodicals was very less. But in 21st century, they grow rapidly and there

number increases to above 2 lakh. Periodicals are important media for communication.

2.2 INCREASE IN SUBSCRIPTION RATES

Periodicals are becoming increasingly costlier. Publication costs are steadily going up and so are the subscription prices. The annual survey of periodicals prices reported in Library Journal from the Faxon on-line title subscription for us libraries indicates that the subscription for us libraries indicates that the subscription rate of periodicals are increasing at the rate of 10% to 15% per annum.

2.3 BOOK BUDGETS

In India the library book budgets are either static or the increase in the book budget is not proportionate to the increase in subscription rates. It is felt that libraries are unable to cope up with the price rise and are spending 65% to 95% of their book budget on acquisition of periodicals. The Indian libraries are not in a position to afford subscription to about 50,000 science periodicals being received by the British Library Lending Division.

2.4: INFLATIONARY EFFECTS

In developing countries like India, the inflationary spiral has been most obvious, and has effected acquisition of periodical publications year after year in a consistent manner. Despite, increase in the number of periodicals, as stated earlier, a strenuous efforts has to be made by the Libraries in avoiding the subscription to new periodicals. Even if there is no change in the number of periodicals subscribed, the percentage of budget spent on periodicals, continues to rise.

2.5: NATURE OF RESEARCH

The nature of research in science is becoming more and more interdisciplinary; (Biomedical, Biotechnology, Medical Biochemistry, Environmental Science and so on. Are the examples) and therefore, there is a continuous shift in thrust areas in research.

2.6: ADVANCES IN INFORMATION TECHNOLOGY

The advances in information technology could be of help in solving the problem of effectiveness and efficiency in the library services but their acquisition and use in a library calls for more funds.

This study will help the libraries to build balanced and maximum used periodicals collection to meet the needs of the users, and suggest rationalization in their acquisition programmes as brought out from this use study. Further, it will help libraries to draw up the retention and weeding policies of periodicals in relation to limited storage facilities.

3 SCOPE OF THE STUDY

The present study is on **"Availability and use of periodical literature in the field of physical sciences in University of Delhi and Jawaharlal Nehru University library: A comparative study"**. The scope of the study needs to be defined in relation to different terms and concepts used i.e. large size university libraries in Delhi selected on the basis of parameters like periodicals in physical science collection; scientists; periodicals; use; and different disciplines i.e. Physics, chemistry and math's.

3.1: LARGE SIZE UNIVERSITY LIBRARIES IN DELHI

Large Size University Libraries in Delhi have been identified with the help of parameters viz. Document collection specialization, size of document collection; number of scientific periodicals acquired, library membership, library budget and the year of establishment.

The detailed method followed for selection is given in the chapter on methodology. Initially both University Libraries selected for studies were.

- (1) Central Science Library (CSL), DU
- (2) Jawaharlal Nehru University (JNU), Library.

3.2: SCIENTISTS

The word 'scientists' is used for a person who professes knowledge of natural of physical science and is actively engaged in scientific research. Dictionaries define scientists as 'A person with expert knowledge of science; a person using scientific methods,' one learned in science especially in natural science, a scientific investigator. According to McGraw-Hill Dictionary of Scientific and Technical terms scientist is a person having training ability and desire to seek new knowledge and new principles and new material in some field of science. Whereas, collier's Dictionary defines, Scientists as 'One who is highly skilled or knowledgeable in science, especially in the are of natural sciences, and is engaged in it as a Profession'. Department of science and Technology in its 'Handbook of Research and Development Statistics' includes degree holders in science and degree holders in Engineering, Medicine, and Agricultural Sciences as Scientific and technical manpower'.

Here for the purpose of this study the 'scientists' includes:

- Faculty members in science departments in the institutions of higher education under study;
- Researcher scholars and fellow involved in scientific research in selected both University Libraries in the three disciplines under study, or working in scientific projects.

3.3: PERIODICALS: INTRODUCTION AND HISTORY

A periodical has been interpreted as a publication in a continuous series with a consecutive number and no predetermined end, as distinct from a single work in separate parts. In the opinion of Andrew D. Osborn "Serial is that publication of a work whose parts are issued serially or periodically... from the idea of parts issued periodically, there arises the concept of periodical... work whose parts may be arranged by the day, week, month etc... specified on the successive issues".

In any subject field nascent thought is first published in the form of periodical literature because of its advantages over other form of literature such as books and monographs. Periodical literature in the field of science and technology is growing enormously since the publication of the first scientific journal. "Journal des Scavans in 1665. This growth has created numerous problems of storage and retrieval for the information scientist. The permanence of the Journal continues today despite a growing use of other method for the dissemination of printed scientific material.

The origin of modern scientific periodical lies in the development of the newspaper and the establishment of the scientific society. Garrison observes that the vague 17th century appetite for new knowledge, manifesting itself as their curiosity about sights parents, marvels, monstrosities and freaks of nature transformed itself in to a widespread intellectual uplift aiming at no less than complete control of the best knowledge available.

The 'Journal des Scavans' is generally cited as the first scientific journal. This was founded by de sallo. The first issue was appeared on 5th January 1665. This issue consisted of twenty pages including ten articles, some letters and notes (as in figure). The first English scientific journal was published only three months after the appearance of the French journal. The council of the Royal Society decreed that the 'Philosophical transactions should be printed

on the first Monday of each month. The first issue was appeared on 6th May 1665 and consisted of sixteen pages comprising a dedication to the society, nine articles, a selective listing of current philosophical books. It was not until the publication of the forty seventh volumes that the transactions became the official organ of the Royal Society. It became a model for many subsequent learned society journals and a standard for publications recording the results of scientific inquiry (as in figure II).

The oldest chemical journal in continuous existence is 'Annales de chimie' which commenced publication in 1789. In 1815 it became 'Annales de chimie et de physique' and in 1914 split in to two publications 'Annales de chimie' and 'Annels de physique'. The chemical society issued its 'Memories and proceedings' from 1841 to 1847 and the 'Proceedings of the American Chemical Society' appeared in 1876.

The first specialized physical journal to be published was 'Journal der physik' which was issued from 1790. In England the 'Philosophical Magazine' a journal devoted to physic was founded in 1798.

Throughout the 18th and 19th centuries the spread of specialized journals continue in to the developing fields of science. The 'Botanical magazine' was founded in 1746 and ultimately become 'Curtis's botanical magazine'. The first illustrated botanical journal and a publication whose exquisitely designed colour plates were to influence illustration in journals relating to all fields of science and technology. The 'Annals of natural history' or 'magazine of zoology' botany and geology' was first published in 1838. In 1840 this publication merged with the 'magazine of natural history and journal of zoology, botany, mineralogy, geology and meteorology' to become the 'Annals and magazine of natural history'.

The new weekly journal, 'Nature', first appeared on 4th Nov. 1869. The stated objects were 'first to place before the general public the results of scientific work and discovery, and secondly to aid scientific men themselves by

giving early information of all advances made in any branch of natural knowledge throughout the world and by affording them an opportunity of discovering the various scientific questions which arise from time to time. Its original aims were realized and Nature has since become the most influential of all scientific journals. The journal is now truly international in flavors. After the Second World War Nature's speed of publication became one of its distinguishing features and the quality which gave scientists the opportunity to be seen to be first in their fields to a world wide audience.

Most of the communication journals were founded in the late nineteen fifties and early sixties. Typical examples are physical review letter; Applied physics letters (American Institute of Physics), chemical communications (chemical society).

Many of the journals contain some review papers in addition to the original papers. These are of immense value to scientists who wish to familiarize themselves with the state of the art in a particular field before committing themselves to a research project. The review journal is composed entirely of review type papers or in some cases, as with Applied mechanics reviews (American Society of Mechanical Engineers), and Mathematical reviews (American mathematical Society) of reviews articles and abstracts. Purely review journals are Chemical reviews (American Chemical Society) and reviews of modern physics (American Physical Society).

3.3.1: DEFINITIONS OF PERIODICALS

There is a great deal of opinion as to the correct definition of the term 'Periodical'. In North America, "serial" is the name most usually given to periodical publications. There is a multitude of definitions for periodical. All definitions have some common ground. There seems to be unanimity of what kinds of publications should be included or excluded from periodicals. The term periodical is used as a blanket term to include serial, Journal, Memoir, Transaction, Proceedings, official organs etc. however, at the present time,

memoirs, reports, transactions and proceedings have been excluded, only a few proceedings and transactions, which were converted, after a few issues, in to periodicals have been included.

Though there are differing opinions as to what exactly constitutes a periodical, yet it generally agreed that it would be a serial publication, with a continuing title, issuing at regular or in some cases, irregular intervals of less than a year.

Houghton defines "Periodical as a type of serial in which parts called issues are characterized by a variety of contributors and contents both within the issue and flow one issue to another. Issues are commonly designed and numbered as constituents of a normal volume, which is completed at, determined intervals by the issue of a volume, title page, and or index. Commonly used synonymous terms are journals and magazine.

According to Ranganathan, "A periodical publication is a document with attributes as stated below:

(1) Periodicity:

A volume or a small group of volumes of it, is published or intended to be published and completed normally once in a year or at other regular intervals though irregularity in intervals is not ruled out;

(2) Distinguishing Number:

Each successive volume or periodical group of volumes is usually distinguished by the year of publication and/or by a number belonging to a system of simple or complex ordinal numbers. Such a number is usually called a volume Number and;

(3) Continuity:

The intention had been to continue the publication forever, though not actually carried out.

He defines periodical as a periodical publication, of which each volume is made up of distinct and independent contributions, not forming a continuous exposition, normally by two or more personal authors and normally the specific subjects and the authors of the contributions in successive volumes also being, in general, different but all the subjects falling within one and the same region of knowledge, contemplated to be brought within its purview.

Librarian's Glossary defines periodical as a publication with a distinctive title, which appears at stated or regular intervals, generally oftener than once a year, without prior decision as to when the last issue shall appear. It contains articles, stories or other writings, by general contributors. At the general conference of UNESCO held at Paris on 19th November, 1964 it was agreed that a publication is a periodical if it constitutes one issue in a continuous series under the same title, published at regular or irregular intervals over an indefinite period, individual issues in the series being numbered consequentially or each issue being dated.

In India, Indian Standards Institution (Now Bureau of Indian Standards) standard defines periodical "as a publication in which each volume is normally made of distinct and independent contributions not forming a continuous exposition, normally by (two or more) different contributors, in successive volumes also being different, but all the subjects falling within one and the same region of knowledge, contemplated to be brought within its preview. Each of its volume is normally brought out in two or more issues at intervals, and it expounds knowledge and not merely repeats the same pattern of information in each volume bringing it up-to-date from volume to volume.

The ALA Glossary of library terms defines a periodical as a publication with a distinctive title intended to appear in successive (Usually Unbound) numbers or parts at stated or irregular intervals and as a rule for an indefinite time. Each part generally contains articles by several contributors.

C.A. cutter, in his rules for a dictionary catalogue (4th ed. 1904) offered the following definitions for a periodical and serial:

Periodical is "A work issued at intervals which are usually regular; it is generally written by many contributors".

Serial is "A publication issued in successive parts, usually at regular intervals and continued indefinitely."

It is clear from the above account that the term "periodical" can be interpreted rightly in the light of certain qualities and attributes which become visible as regards this peculiar type of literature. These may be:

- (1) Continuing publication indefinitely
- (2) Periodicity
- (3) Collectivity
- (4) Continuity of its editorial policy of title with each issue etc.
- (5) Community interest
- (6) Distinct contributions
- (7) Consecutive numbering and the like.

Early literature indicates that the journal probably was not accepted as a definite form of publication in the beginning. Early forms of publications are calendars, almanacs, fair catalogues, newspapers and the like. All these classes contributed significantly to the development of periodical literature.

3.3.3: Periodical Vs Magazine

Oxford English dictionary defines 'magazine' as a publication containing articles by various writers, intended for general reader rather than learned professional, consisting of miscellany of critical and descriptive articles, essays, work of fiction etc. ALA Glossary compares 'Magazines' with 'Journals' and Harrod in Librarian's Glossary' defines it as a periodical publication

distinct from newspaper, independently paginated and identified by date rather than by serial number.

Authorities on periodicals like Osborn and Davinson do not take the term magazine seriously. Machlup draws a clear distinction between 'Magazines' and 'Journal' by saying that magazines are chiefly for a general reader, whereas 'Journals' are for readers specialized in a particular discipline and interested in intellectually sophisticated treatment of a variety of subjects.

Moreover, Magazines are read for recreation and periodicals are read to become more knowledgeable with recent developments in the specified fields. In this study magazines meant for recreational purpose and general reading have not been included in periodicals.

3.3.4: Periodical Vs Journal Vs Serial

'Journal', 'Serial' and 'Periodical'; are the terms, which are used more or less synonymously. In fact, these terms have been used in different countries to represent more or less same category of documents, i.e. 'Journals' in France (Journal des Scavans); 'Serial' in United States, to be more specific in North America (Union List of Serials in United States and Canada, New Serial Titles etc.); and 'periodicals' in Europe and particularly in U.K. (Ulrich's International Periodicals Directory).

The distinction usually stated in between a 'periodical' and a 'serial' is that the periodicals are publications issued at regular intervals (less than a Year); regularly i.e. appearing at regular period of intervals; loosely longer than a day; whereas serials can be issued at regular or irregular intervals and this interval can be a year and more than a year as well. Further, serials are mainly related to its year of coverage and are usually published as a complete volume such as yearbooks, annual reports. Such is not a case with periodicals.

Fortunately, the choice of the term 'serial' or a 'periodical' is among the least consequential from the point of view of scientists. The scientists and scholars do not make as fine distinction between the various forms of periodicals as do those responsible for organizing and analyzing research collection. Osborn rightly points out that it seems wiser to adopt working definition than to confuse both theory and practice with endless exceptions and borderline cases.

3.4: NEED AND IMPORTANCE OF PERIODICALS

Apart from research results, periodicals contain new and latest information about various fields such as correspondence professional announcements, book reviews, and even advertisements. A periodical is much ahead of a conventional book in that information contained in periodical is incorporated in books often quite later. Thus, periodicals are the primary source of information scholars and researchers.

Information on new professions and techniques can appear within weeks of formulation if published in periodical articles before it published in book form. That is why periodicals are more popular than the conventional books to the scholars because they help in faster dissemination of current knowledge. For research purposes, this is what matters because researchers are always in the quest of new knowledge and information.

Periodicals form a very useful reference work in any library supplementing the book collection in many important ways. Moreover, a large number of the journal articles do not subsequently achieve publication in any other form. It is because of this that it is important for libraries to collect and store files of periodicals. Thus, periodicals are useful in a library because of the above mentioned reasons.

Periodicals require a great deal of space to store and display. Once a periodical is entered on a subscription list, it becomes a standing charge upon the library funds for an unforeseeable period of time. In some libraries periodical subscription forms half of the total library budget available for purchase of documents and in some others it is even three – quarters. Moreover, unlike books, payment for periodical publications has to be made in advance. Therefore, keeping in view the fast rising cost of periodicals, it becomes essential on the part of librarians, to be cautious while building up a periodical collection in the library.

3.5: TYPES OF PERIODICALS

According to Houghten several forms of scientific and technical periodicals have evolved in the present century. These may be classified into three groups according to their publishing origins and then again within each group according to their function. These are:

(a) Learned societies and professional Institutions Journals:

Examples of these types of periodicals are Aslib proceedings, proceedings of the Royal Society, etc. since the earliest days; these learned societies have been responsible for a significant proportion of the total publication. The main purpose of such periodicals is to furnish an opportunity for authors who are usually members of the learned bodies concerned, to publish the result of their investigations. A majority of the titles in this group are research journals.

1. Primary
2. Communication
3. General Purpose
4. Review

(b) Commercially published journals:

A very high proportion of periodicals fall in to this category and in all types of libraries they are represented. Every kind of periodicals from the highly technical to the comic strip magazines came under this category. There is an interest of profit making as the part of the publishers of such publications.

1. Primary
2. Technical and Trade
3. Controlled circulation

(c) House journals:

Commercial firms for prestige, goodwill, sales promotion, and advertising or staff welfare gestures issue these. They are often distributed free of cost and are usually ephemeral in nature.

1. Prestige
2. Information on products
3. Internal house organs.

The periodicals can be grouped in to two major types on the basis of the information contained there in. these are:

1. Primary Journals
2. Secondary Journals

1. Primary Journals

The primary journals of course devote themselves to reporting original research known also as 'Reporting Journals'. The primary journals are the basic sources of information and nascent thought. Generally each volume of a periodical contains a number of independent distinct articles of different authors. The primary journals are the most important medium for communication of ideas, exchange of experience and transmission of current information.

Examples of primary Journals

- I Bio-chemical Journals
- II Journal of physiology
- III Annals of Botany
- IV Molecular Physics and so on.

2. Secondary Journals

The secondary journals on the other hand, is to "digest, comment on and interpret the research reported in the primary literature". With the rapid

increase in the number of primary sources together with the accompanying extension in the amount included in them, it became very desirable to have some agency for collecting, classifying and summarizing this material as soon as possible after its appearance.

Depending upon the information furnished and upon the method of arrangement used, the periodicals supplying this kind of information have been grouped under the headings:

- (a) Indexing Periodicals
- (b) Abstracting periodicals and
- (c) Review Periodicals

(a) Indexing Periodicals

They contain compilations of reference only; including the author's name, title of the article, and the citation is to help the researchers in finding out the required scientific documents.

Examples of Indexing Periodicals

- I. Current chemical papers (1914-)
- II. Current contents (1958-) etc.

(b) Abstracting periodicals

They contain concise summaries of the various articles, bulletins, patents and other publications. Each entry furnishes the following information title, author, and original reference to the periodical, volume, page and year of publications sponsor, place etc., and the abstract.

Examples of Abstracting Periodicals

- I. Chemical Abstracts (1901-)
- II. Biological Abstracts (1926-)
- III. Indian Science Abstract (1965-)

(c) Review Periodicals

These provide brief account of the development in various fields for some given period of time. The accounts are known as "review periodicals also.

Examples of Review Periodicals-

Annual Reports of the Chemical Society (London) (1904-).

Science Progress (1906 -)

Chemical Reviews (1924-)

The above mentioned types of periodicals serve as important tools for the researchers. The primary journal provide the original results of various researchers in the different fields of knowledge, whereas the secondary journals have served as source to reached those articles containing the nascent micro-thought.

3.6: PERIODICAL COVERED IN THE PRESENT STUDY

The 'Periodical' in the present study means all those publications, which are issued at regular intervals; consecutively numbered, intended to be continued indefinitely; made up of independent contributions by many authors. And on different aspects of subjects falling within one and the same region of knowledge; and the author and the contributors in its successive volumes are normally different.

All periodicals having the regular frequency of less than a year, and are of use to scientists (as defined earlier); and are of research nature in the specified discipline of Physics, chemistry and Math's; communication periodical or a research report periodical, a review periodical or a research reports periodical, a review periodical or a letter periodical and so on. Have been covered in this study. However, indexing and abstracting periodicals have not been covered in the present study, as these serve as location tools and are not used by the scientists for an in-depth study of the subject. Further, present study covers the periodical published in printed and non-print form. This study

includes periodicals published in English language or available in English translation in the specified subject areas of study.

3.7: SCOPE OF SUBJECT

3.7.1: PHYSICAL SCIENCES

Physical sciences are generally considered to include Astronomy, Chemistry, Geology, Mineralogy, Meteorology and Physics, these overlap more or less as illustrated by astrophysics, chemical physics, physical chemistry and geophysics. There is overlap likewise between the physical and biological sciences as seen in biochemistry, biophysics, virology and the close relationship between geology and chemistry.

3.7.1.1: PHYSICS

Physics deals with understanding the structure of natural world and explaining natural phenomena. Fundamental questions on the structure of matter and the interaction of the elementary constituents of nature that are susceptible to experimental investigation and theoretical inquiry fall in the area of physics.

Sometimes around 340 B.C. Aristotle invented the name Physics, taking as his root word the Greek word Physikos, meaning "nature". The ancients to denote the study that treats of the natural world and its phenomena used this term.

Physics is the science that tells us about natural laws and processes. It is not a static science but one that is actually changing.

Encyclopedia Britannica defines Physics as "It deals with those fundamental questions on the structure of matter and the interactions of the elementary constituents of nature that are susceptible to experimental investigation and theoretical inquiry.

Under its earlier title of natural philosophy, physics encompasses a much wider field, but by a process of excluding Branch's as they developed in to specialized sciences (chemistry, astronomy, metallurgy, meteorology and geology), it has been limited to its present scope.

The most basic parts of physics are Mechanics and field theory. Mechanics is concerned with the motion of particles or bodies under the action of given force. The physics of fields is concerned with the origin, nature and properties of gravitational, electromagnetic nuclear and other force fields. Taken together, mechanics and field theory constitute the most fundamental approach to an understanding of natural phenomenon which science offers. The ultimate is to understand all natural phenomenon's in these terms.

As stated in McGraw Hill Encyclopedia, in every area physics is characterized not so much by its subject matter content as by the precision and depth of understanding. The aim of physics is the construction of a unified theoretical scheme in mathematical terms whose structure and behavior duplicates that of the whole natural world in the most comprehensive manner as possible. Where other sciences are content to describe and relate phenomena in terms of restricted concepts peculiar to their own disciplines, Physics always seeks to understand the same phenomenon as a special manifestation of the underlying uniform structure of nature as a whole. I lime with this objective, physics is characterized by accurate instrumentation, precision of measurements and the expression of its results in mathematical terms.

BRANCHES

(a) Classical Physics

The branches of Classical Physics are

(1) Mechanics

Concerns the motions of bodies of matter, either as a whole or internally (as when they are deformed). There are number of topics within the general field of Mechanics. These are

(a) Kinematics is the mathematical description of the linear motion of a point or the rotational motion of a connected set of points, without regard to specific physical properties such as mass.

(b) Dynamics combines kinematics with physical properties such as the mass of the body and the forces which express its interaction with other bodies and which lead to changes in its state of motion. A portion of dynamics of great use in engineering is static's, which deals with the situation in which all forces on a body are balanced or in equilibrium. Hydrostatics, Hydrodynamics and Hydraulics apply the same fundamentals to the more complicated mechanics of fluid (liquids and gases).

(c) Properties of Matter: Comprises the general mechanical properties of matter in each of its three physical states – solids, liquid and gaseous and the laws that express the casual relations found to exist among them. It includes all the distinctive data and physical constants obtained by experimentation with different kinds of material. Density, Gravitation, buoyancy, gaseous – and the law that express the causal relations found to exist among them. Density, gravitation, buoyancy, gas laws, elasticity, viscosity, diffusion, osmosis and surface tension are some of the subtopics of this subject.

(2) Acoustics

Acoustics deals with audible sound and ultrasonic. Audible sound is a series of waves in matter, of rapidly alternating pressure and density changes, originating in the vibrations of material bodies (stretched strings, rods, plates and air columns) and detectable by the ear. Ultrasonic has practical applications as in communications and testing of materials. On a scientific

plane it is connected with the theories of the structure of matter, and it furnishes a useful tool in studying matter at the molecular level of subdivisions.

(3) Heat

The subtopics of heat are thermometry, thermal expansion, calorimetric, change of state, heat transfer, and thermodynamics. Thermometry covers the usual empirical methods of temperature measurement. Thermal expansion includes the empirical relations existing between physical dimension and temperature for different materials. Calorimetric and changes of state deal with measurements of quantities of heat. Transfer of heat may be accomplished by 3 different methods: conduction, Convection and Radiation. Thermodynamics is involved whenever there is a transfer in to heat energy of any other form of energy or vice versa.

(4) Electricity and Magnetism

These two are now generally combined in a single subject, although in earlier times different phenomenon were studied separately as magnetism, static electricity (electrostatics) and current electricity.

Magnetism: covers the properties of permanent magnets and the surrounding magnetic fields. Many of the magnetic properties of the earth have been included in these subjects. The properties of diamagnetic, paramagnetic and ferromagnetic substances are now considered a part of current electricity and the modern problem of the structure of matter.

Electrostatics: is concerned with electricity charges and with the force and energy relations existing when various arrangements or distributions of charges are set up.

(5) Optics

Physical optics covers all aspects of light, including its electromagnetic nature, as well as the properties of bodies that emit light or

transmit, reflect or absorb it. These include diffraction (bending around corners), interference of two waves, polarization and special information concerned with the various frequencies of light (color and spectra).

(b) Modern Physics

It is directly concerned with the ultimate structure of matter molecules, atoms, nuclei and fundamental particles. The various branches of modern Physics are

(1) Particle physics or High energy Physics: is concerned with understanding the properties and behavior of elementary particles and more particularly of the heavy particles – mesons, baryons and their antiparticles – which are produced in collisions involving energies in a range measure in billions of electron volts.

(2) Nuclear Physics: deals with associations of neutrons and protons forming the nuclei of atoms; their structure, properties and states; reactions between nuclei, including scattering processes and radioactivity and related phenomena such as the interactions of high speed nuclear particles with matter.

(3) Atomic Physics: It is concerned with the structure and properties of atoms as determined by the electrons outside the nucleus; the states of motion of these electrons, including such topics as energy levels, angular momentum properties, and magnetic moments; and the absorption and emission of radiation by atoms.

(4) Molecular Physics: is concerned with systems of atoms formed into molecules, the nature of intermolecular forces, chemical binding, vibration and rotation spectra of molecules and the like.

(5) Solid state Physics: It treats the electrical, magnetic, optical and elastic properties of solid materials and by extension those of materials in the condensed states.

(6) Physics of Liquids: deals with physics of liquids.

(7) Physics of Gases: deals with physics of gases.

(8) Plasma Physics: deals with properties of highly ionized atoms (forming a mixture of bare nuclei and electrons called ion plasma).

(9) Biophysics: deals with the application of physical methods and types of explanation to biological systems and structures.

Other more specialized classification has been made in accordance with particular instruments or techniques such as X-ray diffraction, Neutron diffraction, Mass spectra, Infrared Spectroscopy and Seismology.

The specific field of low-temperature physics (Cryogenics) is characterized not only by specialized instruments involved in the production and measurement of low temperatures in the range of liquid helium but also the phenomenon of superconductivity and superfluidity which occur only in this temperature range.

Mathematical Physics: is the study of physical phenomenon by means of mathematics, and includes the more mathematical parts of all branches of physics as well as most of the content of statistical mechanics, quantum mechanics; relativity and field theory.

With the exception of sub disciplines resulting from the fusion of Physics with another discipline e.g. Astrophysics, Geophysics, and Biophysics and so on, the present study sub disciplines are probably the result of splitting off or of simple division.

Present study covers all the above fields of physics and its interdisciplinary subdivisions.

3.7.1.2: CHEMISTRY

Chemistry was born when the alchemists gave up the attempt to fathom the constitution of matter and confined their investigations to the more tangible chemical elements. Dictionary of science defines Chemistry as the study of composition of substances and of their effects upon each other.

Chemistry deals with the preparation, properties, structure and reactions of material substances. Since diverse substances are present in nature, the scope of chemistry is immense. Chemistry interfaces with all scientific disciplines and knowledge of the subject is essential.

Today the objective of the chemist is to aid in the interpretation of the universe. He has made much progress toward meeting this objective because he knows about not only the structure and composition of many of the materials on the earth, but also those of the planets, the satellites, the stars and the materials of interstellar space.

The field of Chemistry is large one. The following are the subdivisions used to classify various aspects of chemistry are

(1) Physical Chemistry:

It is a method of approach to any chemical system, either a single substance or a mixture of substances, without regard to whether the substances are organic or inorganic or both. It includes the study of all properties that can be measured, the development of experimental methods and instruments to make the measurements, the rationalization of measurements that have been made, the development of theories (particularly theories that can be expressed mathematically), and the prediction of the values of properties that can be checked by experimental measurements.

(2) Organic Chemistry:

It is the chemistry of carbon compounds, which also contain elements other than carbon such as hydrogen, oxygen, sulfur, nitrogen, phosphorus and chlorine.

(3) Inorganic Chemistry

It encompasses all substances that are not organic. i.e. it is the study of elements and their compounds and usually includes the study of elemental carbon, its oxides, metal carbonates, and sulphides while all other carbon compounds belong to the study of organic chemistry.

(4) Analytical Chemistry

It deals with the identification of the substances present in a sample and the determination of the quantity of one or more substances in a sample.

(5) Biochemistry

It deals with the chemistry of biological systems. Biological studies range from the identification of compounds present at particular biological sites to very comprehensive investigations of the detailed mechanism by which compounds are transformed from one in to another, with particular attention to the energy changes associated with each of these transformations.

Chemical Abstracts

groups its coverage into 60 fields which in turn are grouped under 5 main sections.

(1) Biochemistry

In the biochemistry section are the following topics – history, education, and documentation; general biochemistry; enzymes; hormones and related substances; radiation biochemistry, biochemical methods; plant biochemistry; microbial biochemistry; non-mammalian biochemistry; animal nutrition; mammalian biochemistry; mammalian pathological biochemistry;

immunochemistry; toxicology; pharmacodynamics; fermentation's; foods; plant growth regulators; pesticides; fertilizers, soils and plant nutrition.

(2) Organic Chemistry:

Covered under organic chemistry are the following: general organic chemistry; physical organic chemistry; aliphatic compounds; alicyclic compounds; noncondensed aromatic compounds; condensed aromatic compounds; heterocyclic compounds (more than one hetero atom); organometallic and organometalloidal compounds; treenails; alkaloids; steroid; carbohydrates; synthesis of amino acids, peptides and proteins.

(3) Macromolecular chemistry:

This section includes synthetic high polymers; plastic manufacture and processing; plastics fabrication and uses; elastomers; including natural rubber; textiles; dyes, fluorescent whitening agents and photosensitizes; leather and related materials; coatings, inks and related products; cellulose, lignin, paper, and other wood products; industrial carbohydrates; fats and waxes; surface active agents and detergents.

(4) Applied Chemistry and chemical engineering:

The applied chemistry and chemical engineering section covers the following subjects: apparatus and plant equipment; unit operations and processes; industrial inorganic chemicals; propellants and explosives; petroleum, petroleum derivatives and related products; coal derivatives; mineralogical and geological chemistry; extractive metallurgy; ferrous metals and alloys; nonferrous metals and alloys; ceramics; cement and concrete products; air pollution and industrial hygiene; sewage and wastes; water; essential oils and cosmetics; pharmaceuticals; pharmaceutical analysis.

(5) Physical and Analytical Chemistry:

This section abstracts studies of general physical chemistry; surface chemistry and colloids; catalysis and reaction kinetics; phase equilibria, chemical equilibria, and solutions; thermodynamics, thermo chemistry and

thermal properties; crystallization and crystal structure; electric phenomena; magnetic phenomena; spectra by absorption, emission, reflection or magnetic resonance and other optical properties; radiation chemistry, photochemistry and photographic processes; nuclear phenomena; nuclear technology; electrochemistry; inorganic chemicals and reactions; inorganic analytical chemistry; organic analytical chemistry.

Present study covers all above fields of chemistry.

3.7.1.3: MATHEMATICS

Mathematics is frequently found in associations and interaction with astronomy, physics and other branches of natural science and it also has deep-rooted relationship to humanities. Actually it is a bunch of knowledge entirely by itself and one of considerable scope. Mathematics is a stem of a tree of which roots are learnable knowledge.

G James has defined mathematics as "the logical study of shape, arrangement and quantity"

According to **Caniel N Lapedes** "mathematics is the deductive study of shape, quantity, and dependence."

According to **Chamber's Twentieth Century Dictionary** "mathematics is the science of magnitude and numbers and of all their relations.

From the above three definitions it is clear that mathematics is nothing but a highly developed branch of logic. It is characterized by abstract reasoning in which conclusions are deduced from hypothesis by means of logic.

The two main areas of mathematics are pure mathematics and applied mathematics.

Pure Mathematics:

It is the study and development of principles of mathematics as such for their own sake and possible future usefulness rather than for their immediate usefulness.

Applied Mathematics:

It is related with the study of the physical, biological and sociological worlds. It is mathematical structure utilizing, in addition to the purely mathematical concepts of space and number, the notation of time and matter as to the domain of applied mathematics.

The major branches of mathematics are:

Mathematical logic and foundations; set theory; combinatorics; order, lattice, ordered algebraic structures; number theory; field theory, polynomial; commutative rings and algebra's; algebraic geometry; linear and multi linear algebra; K-theory; group theory and generalizations; topological groups, lie groups; real functions; measure and integration; functions of complex variables; potential theory; several complex variables and analytic; special functions; ordinary differential equations; partial differential equations; finite differences and functional equations; sequence series, summability; approximation theory and expansions; Fourier analysis; abstract harmonic analysis; integral equations; functional analysis; operator theory; calculus of variations and optimal control; geometry; convex sets and related geometric; differential geometry; general topology; manifolds and cell complexes; global analysis, analysis on manifolds; probability theory and stochastic process; numerical analysis; computer science; mechanics of particles and systems; mechanics of solids; fluid mechanics; optics, electromagnetic theory; classical thermodynamics, heat transfer; quantum mechanics.

Here in this study mathematics has been taken with its various subdivisions with its different branches as indicted above.

3.8: USE

'What is use?' unfortunately in information science, less efforts have been made upon the formulation of accepted definition of concept of 'use'. Line's definition of use is a satisfied demand or it may be the result of browsing the material and 'use is what an individual uses' reflects the library user's point of view. Norman Robert put forth the librarian's view point of use. According to him browsing the material or taking a book off the shelf does not constitute use from individual stand point but from librarian's point of view it is use because the provision of material which is browsable and borrowable is one of the services offered by the library and borrowing a book should be treated as 'use' of the services as well as of the library. According to this definition what an individual does with the borrowed material is not the concern of librarian.

These overlapping meanings and ambiguities associated with 'use' make vigorous definitions and limitation essential in the research situation. Chen while discussing 'use' points out that despite the value of every use study, one should bear in mind that it has an inherent limitation, it can give only quantitative evaluation rather than qualitative. A less used periodical may be of much more importance than indicated quantitatively by a use study. Wenger and Childress stress on the 'variable use value' and 'use density value'. According to them each 'use' has its own use value and quality of use should be weighted accordingly.

In present study 'availability' and 'use' has been taken as:

- An act of taking a periodical off the shelf and not reshelfed by the user after its use by him;
- A request made for photocopy of articles published in periodical;
- Getting a periodical on inter library loan;

- Having been cited in published work of or in research work of a scientist; and
- Perceived by the scientists as useful or most useful for his scientific and research work.

4 OBJECTIVES

The present study as defined in the 'scope' has been conducted with the following objectives.

1. To identify the information needs of the users.
2. Study and evolve the information seeking behavior pattern of the users.
3. To identify pattern of availability and use of periodicals in chemistry, physics and math's.
4. To identify unused and less used periodicals and, suggest ways and means to improve their use.
5. To compare the use of periodicals in chemistry, physics and math's in both University libraries.
6. To identify periodicals for remote storage, cancellation on the basis of uses.
7. To identify the periodicals used most frequently in chemistry, physics and math's.
8. To study the 'obsolescence' and 'Half life' of periodicals received and used in the both university libraries under study in chemistry, physics and math's.

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5 HYPOTHESES

The following hypotheses are proposed to be tested in this study. These relate to all the three subjects under study unless otherwise specifically stated in the hypothesis.

1. Periodicals occupy the first rank as a form of documentary resource for study and research by faculty members in Physics, chemistry and math's;
2. Ranked list of periodicals generated on the basis of one indicator does not bear significant correlation with ranked list prepared on the basis of another indicator;
3. Use of periodicals in physics, chemistry and math's in DU and JNU in general bear any relationship;
4. An increasing in the periodical in the collection also increases, the proportion of unused titles; ?
5. There exists negative correlation between the total subscription and the total use of periodicals;
6. The periodical usage bears no correlation with the country of origin, language, and age of the periodical;
7. Periodicals published by learned societies and scientific research organizations are more used than those brought out by others.

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CHAPTER 2

REVIEW OF LITERATURE

1 INTRODUCTION

The use of literature of Physical Sciences can be ascertained from use and user studies in the subject fields. Large number of such studies has been conducted in the past. The earliest 'use' and 'user studies' were conducted to measure the adequacy of library collection. Gross and Gross, in 1927, were perhaps the first to attempt the identification of the use of periodicals on the basis of citations in Journal of American Chemical Society. Until 1960's the literature on use of scientific periodicals is scanty. Menzel while doing an inventory of the concerned literature identified 1963 as the take off point for studies on information needs and use of literature of science and technology. In 1964 Aurbach Corporation brought two bibliographies out one by Davis and Bailey on use and user studies and other. These can be termed comprehensive and they contained 438 and 676 items respectively. Paisley reviewing the literature on flow of science and information from earliest till December 1965 found only 33 items worth mentioning. By 1977, the estimated figure of these items was 1000.

As stated above, in initial stages, the investigations did not concentrate on methodology and the emphasis therefore was on adequate collection development. With the publishing of 'science citation index' in 1961, the studies on the use of periodical literature became more sophisticated using all aspects of quantitative and qualitative nature. Methods used in collecting data also got emphasis, as there was wide variation in their use ranging from call slips used by Notheison to circulation charge cards used by Fleming and Kilgor, and Pings; inter library loan forms used by schilling; and photocopy request data used by Basile and Smith; to the questionnaire technique used by Stangle and Kilgor, Hoisington. By 1970's Harris realized that some more meaningful conception relating to type and extent was needed for use of periodicals. Many

studies relating to communication and information seeking behavior of periodicals were conducted. Some of the important ones are by Price, Slater and Fisher, Nelson and Pollock, Hagstrom, Wood, Crane, Allen, Garvey, and these have been discussed in subsequent section of this chapter. In addition, the use of scientific periodicals in various libraries has been studied by Chen, Line and Sandison, Campbell, Scales, Wenger and Childress, Osiobe, Flynn, Anthony, East and Slater, King and Roderer, Midorikawa, and Quinn. In late eighties the emphasis has been shifted from the above aspects to identify economic value of information and as a result several 'cost-benefit-studies' have been conducted. Weil in 1980 conducted a study to determine if the value of periodical was worth, how much were the cost, and King and Griffith conducted two studies to identify how much scientists read and the value of that reading. However, for the purpose of our study, we are mainly concern with studies relating to use of periodicals and related issues. These have been discussed in the subsequent sections.

2 COMMUNICATION AND INFORMATION SEEKING BEHAVIOUR OF SCIENTISTS

Various studies particularly by Price, Hagstrom, Allen, and Garvey reveal that there is a larger volume of communication between scientists before publication than after publication. Pre-publication communication includes personal correspondence, conversations and presentations at professional meetings and conferences, etc. with in the domain communication functions through the mechanism of 'invisible college'. The concept of 'invisible college' was first described by Derek J Desolla Price, and later studied by Crane. 'Invisible College' consists of a group of people with similar interests who use a number of informal communication channels.

Information on current research flows through invisible college networks six to twelve month before it reaches the formal publication stage. However, Garvey identified this time as 28 months, from the initiation of the work to its publication in a periodical. According to Griffith a 'majority' (i.e. adapter

Scientists) have low contact rate than an 'elite's' (i.e. innovator scientists) whose frequency of contact is 8 times higher than the 'majority'. Crane however, feels that interactions among these innovator elite scientists and 'majority' attract other scientist. In a typical organization, according to Allen elites exist as 'gatekeepers', who serve as the focal point for information originating outside the organization. Further, these 'gatekeepers' facilitate information flow from outside and transmit the same to their colleagues. On an average, they read more scientific periodicals and have better contacts with those who provide the information from outside the organization. Grogan has concluded that such a communication is more concentrated, exclusive, and up to date and is within the control of the 'elites'.

It can, therefore, be concluded that pre-publication communication, plays an important role in acquisition and use of information by scientists, through 'Invisible Colleges'. It is also regarded as more than complementary source of information. A 1978 study for National Science Foundation found that 18% of the reading of the periodical articles were as 'personal referral' as experts. Agricultural review committee in 1979 has rightly said, "the reading, listening, talking, and writing all stand in the web of scientific communication, without which science would not be a science".

3 USE OF PERIODICALS

3.1 IMPORTANCE OF USING PERIODICALS

For scientists, despite importance and amount of time spent on informal communications, one is initiated to more use by items from formal sources like reading articles or reviews etc. in periodicals. Fishendon conducted a survey of scientists to identify the sources from which they get most of ideas for research and periodicals have been ranked as 36.5%, oral and written communications 13.15%, current awareness services 18.25%, and others 11.80%. Slater and Kennan ranked these sources of information as periodicals 24.25%, written and oral personal communication 20.25%, abstracting journals 18.25%, talks at

meetings 16.25%, reprints 12.15%. Libby and Zaltman ranked periodicals at the top with 46%, personal communications 23% abstracting services 22%, talks t meetings 5%, and others 4%.

3.2 FINDINGS OF DIFFERENT STUDIES

Findings of few studies on the Availability and use of periodicals conducted in different libraries have been given in the following sections.

3.2.1 Gross and Gross

As already mentioned, the earliest studies of use were conducted to measure the adequacy of library collection. The study by Gross and Gross is considered as the first systematic attempt to identify use as well as to measure the adequacy of library collection for collection development. It uses citation count method in 'Journal of American Chemical Society'.

3.2.2 Bradford

Based on the study of counting references – not at the end of research papers, but in current bibliographies of the subjects – Bradford enunciated his 'Law of scattering' in his classic work 'Documentation' in 1934. He put it as Articles of interest to a specialist must occur not only in the periodicals specializing in this subjects, but also, from time to time, in other periodicals which grow in number as the relation of their field to that of his subject lessens and the number of articles of his subject in each periodical diminishes". In other words, a relatively small number of cores of periodicals will account for as much as 90% of the significant literature, while attempts together 100% of it will add periodicals to the core at an exponential rate.

3.2.3 Fussler

Fussler's study in 1949 is an effort to ascertain some fundamental characteristics of the literature in Physics and chemistry used by researchers in the United States. It is based on the study of key Journals 'Physics Review' and 'Journal of American Chemical Society'. The study has adopted random sampling method and covers period 1899 to 1946. Fussler identified that 30.5% and 32% of periodical titles in Chemistry in 1939 and 1946 revealed use of 71.2% and 68.5% references respectively. Further, 20.2% and 25.3% periodicals titles in Physics in 1939 and 1946 revealed use of 63.1% and 69.9% of references respectively. It has also been found that there is a consistent and regular decline in number of references per periodical title and it is more pertinent in the field of chemistry i.e. it has declined from 38.2% in 1899 to 12.7% in 1946, followed by Germany 24%, Great Britain 12.7%, France 4.8% and the remaining European countries contributed 5.4% references during the year. In Physics again USA contributed the maximum percentage of references in 1946 i.e. 57.7% followed by Great Britain 14.7%, Germany 12.6%, France 2.6% and the remaining European countries 12.4%.

3.2.4 Brown

With a view to help in collection development and selection of scientific serials, CH Brown conducted citation studies in various fields of science (Physics, Mathematics, Chemistry, Botany, Zoology, Entomology, Physiology and Geology) and published his finding in the monograph entitled 'Scientific serials'. The inferences drawn by him are: Scientists are more dependent on serials than books and the dependence of a 'Chemical Scientists' 93% of use is from 'serials', whereas, for physicists 90.3% and or a Mathematician's 86.1%, and for a Geologists 83.8%. However, 90% use of most cited periodicals is from 37 periodicals in Physics. In chemistry also it is from 37 periodicals, whereas in mathematics 53, in Physiology 57, In Geology 62, in Zoology 67 and in Math's it is from 68 periodicals. With regard to the period, according to Brown, 91% of the cited literature in physics is published during the last two decades (1934-1953); whereas in Math's 89.5% from last three decades (1924-1953); and in chemistry 91% citations are last four decades (1914-1953). US publications

contribute maximum to the citations in all the subjects of science under study. In chemistry it is 65%, Physics 58%, and in Maths 57% citations are from periodicals published in US, followed by Great Britain, Germany, and France.

3.2.5 Vickery

B C Vickery compared 'use frequency' of science and technology periodicals obtained by using different methods such as: (a) citation by author (SCI); (b) citation by a sample of British authors, (c) Requests received at National Lending Library (NLL), (d) Listing of periodicals I World List of Scientific Periodicals, (e) and the number of items annually published in different periodicals. On the basis of findings from all these methods, he listed 89 ranked titles in each list and found very little correlation amongst different methods. It has also been found that only a dozen titles are common to all five lists.

3.2.6 Chen

Chen investigated the use pattern of periodicals/journals in Physics at MIT science Library during the period March - June 1971. Chen finds, despite the value of use studies, such studies have inherent limitations namely theses can give only quantitative evaluation rather than qualitative. Chen used 'in library use', 'circulation statistics' and 'inter-library loan statistics' as indicators of use. He identified that out of 220 periodicals in physics, only 138 i.e. 62.7% have been used once during the period of 3-1/2 months of his period of study. The peak use of periodicals is of those published in late 1969 and early 1970. Chen found 49 periodicals accounted for 90% of used, whereas 52.3% of total use occurs in literature of physics of less than 6 years i.e. the 'half life' of periodicals in physics at MIT is 5.5 year and the period of obsolescence is around 14.5 years in contrast to the finding of Burton and Kebler and Fleming and Kilgor who identified 5 and 6 years as the period of obsolescence. By analysing ten top heavily used periodicals he showed that periodicals do vary in usefulness of contents from year to year and it would be dangerous if librarians

make decisions on remote storage, weeding, cancellation or discard by setting an arbitrary cut off date.

3.2.7 Campbell

Campbell surveyed the use of periodical in Wolver Hampton Polytechnic Library. The indicators used are: (a) Internal use (In Library use), (b) inter Library Loan, and (c) Citation study. For internal library use the result was that the rank list of 70 most heavily used periodical titles constitutes 71.2% of use. Comparison of the use and cost figures revealed that 73% of user requirement could be met by spending 46% of the present total subscription cost and 92.5% of all periodical requirements could be satisfied by 71.5% of total cost. In case of citation analysis 15 titles generated 50% of the total citations count, which is in accordance with Bradford's - Zipf distribution. With the minor exception of the Mathematics/computer science journals, the correlation in two sets of indicators internal use and citations clearly indicates that the majority of periodical use is associated with the research functions. With the indicator inter-library loan Campbell concluded that majority of the use is concentrated in Chemistry and the Life Sciences. Campbell also concluded that rank list of periodical titles will change with time i.e. the periodicals which are highly ranked now may assume a lower rank at a later date.

3.2.8 Scale

To test the validity of citation as an indicator of use, a comparison was made by Scale between ranked lists of most used periodicals and the most cited periodicals as given by Journal citation Report (JCR). Survey was carried out at National Lending Library and it revealed a small degree correlation in citation analysis and actual use. Spearman rank correlation coefficient were calculated and found to be 42 for the 50 most used periodicals and 26 for the 50 most cited, only 16 titles were common to the list of 50 most cited and 50 most used.

In the words of scales many journals in high use (for example those scanned to keep abreast of current knowledge) are unlikely to be frequently cited and journals featuring highly in the citation ranking may owe their position partly to self-citation. However, it is noticeable that several of highly used titles are little cited journals and are of applied nature. Citation appears only after a delay whereas use can be immediate. Further, scale also correlated frequency of use of NLL with Chen's data of MIT. She found low correlation between MIT and NLL and only slightly better correlation between in library use study at MIT and use findings on the basis of JCR, suggesting thereby that rank lists produced by analysis of citation do not constitute valid guides for journal selection by libraries.

3.2.9 Wenger and Childress

Wenger and Childress on the basis of the study conducted at National Oceanic Atmospheric Administration Library at Boulder, Colorado for six months using in-library use as an indicator, analyzed data by using 'variable use value' and 'use density correlation'. According to him 'it is important to realize the significance of the total raw use of title. Low use density does not automatically indicate low value because some journals require much larger amount of shelf space than others, their use densities will be lower even though they provide a larger contribution to the total use of the collection'.

They recommended:

- A three months use study is sufficient. 84% of the 0 or 1 use titles in 3 months become 0, 1 or 2 uses after 6 months.
- Use density data are much more time consuming to calculate and organise and possible of no more value than raw use data for determination of low value titles.

- Recommendation by one scientist to start or retain a periodical subscription is a strong indicator of sufficient use to retain the subscription.
- A questionnaire is not recommended to replace the use study.
- There is a significant correlation between number of uses for a title and number of scientists recommending that title.
- Collection balance can be obtained by determining use shelf space ration for each subject area.
- New or added titles for enhancing collection relevance may be obtained from: (I) Questionnaire, (ii) Comparison with journal core lists, (iii) Inter Library Loan, (iv) collection balance studies, and (v) Analysis of highly used titles.

3.2.10 Flynn

Flynn examined six science and engineering libraries at the University of Pittsburgh for 'periodical use'. Data were based on samples of use taken at various intervals. Long term daily use records were examined. Research findings revealed that in Physics 37% of the collection supplies 100% of the use. Most use is of periodical published within the current year and the previous 5 Years. The use of periodicals older than 25 years is only 5%; 40% of the photocopying of relatively new journals originates from browsing. Over 90% of the photocopying of journals are more than 2 years old and are based on reference. Moreover, students are the heaviest users of journals.

4 METHODOLOGY USED IN VARIOUS STUDIES

The review of literature reveals that several different methods for detecting and measuring periodical use have been used. Often techniques

employed were a result of easily obtainable data and technological advance's. According to Notheison, Line and Wood, Perk and Pulis past check out records, or data request slips turned in by patron's for retrieval of materials from areas closed to the topic are common sources of use data. Monitoring and reshelving of used library material is another method of gathering data on the long term use of periodicals and the same has been used by Smith, Shaw Sullivan and Vadeboncoeur, Alldredge, Chen, Wenger and Childress, Rice. As technological innovation proceeded, other methods of measuring used were developed. When the process of photo duplication was refined and the costs of photo duplication gradually declined, libraries began to provide photocopy services. Periodical used data could then be obtained from records of libraries with controlled photocopy services. Ash and Morgan, Kamenoff, Rice, Line and Wood have used this method.

Osiobe, Grefsheim and Meredith have found out that questionnaires and surveys offer other alternatives for exploring and analysing used of journal. For Gross and Gross, Garfield, Singleton, Scale etc. citation technique is the favored method and used by many famous surveyors.

With the application of computer technology in libraries in the 1970's computer punched cards were used in studying the use of periodicals. Campbell used 80 column punch cards.

In India too, few studies conducted in this area have revealed the use of questionnaire supported by interview. Some have used observation method as well. Dhawan and Yadav, and Sengupta and so on. Have used citation technique, as well as analysis of loan records.

5.1 GENERAL

5.1.1 Scientists spend much more time in informal communication channels of information than reading, and despite great importance and amount of time spent in informal communications more use is made of formal sources of information.

5.1.2 Scientist extensively uses periodicals, printed and non-print matter and browsing through a comparatively small number of periodicals identifies most of the reading.

5.1.3 Use of periodicals measured through various variables separately such as in-library use, citation records often do not give similar results. Even the rank lists prepared by one indicator may vary from year to year. And thus many surveyors do not recommend the discarding or cancellation of periodicals on the basis of the results of a survey done by taking one indicator.

5.1.4 One of the most striking use patterns in the data of almost every survey of periodical use is 'Bradford's law of scattering' (also refereed to as Bradford's distribution of the Bradford's Zipf phenomenon or the 80-20 rule). Though there is no fix ratio as 80:20 but it is generally concluded that high percentage of demand can be satisfied by small number of periodicals and for rest small percentage of demand a library has to acquire larger number of periodicals.

5.1.5 The point of 'obsolescence' and the 'half life' of periodicals differ not only from subject but also from library to library. Even it may differ from periodical to periodical. Further, the research articles in periodicals are highly cited immediately after publication and continue to be cited frequently, during the next 12-15 years.

5.1.6 Most agree that non-English language material is generally neglected by researches whose primary language is English. Hutchins, Parageter and Saunder also found that English journals are more used. The use of periodicals on the basis of languages listed in their descending order is: English, German and French.

5.1.7 Periodicals published from USA have larger readership as compared to those from other countries.

5.1.8 Scientific societies like AIP, American chemical society and so on. Play a dominant and useful role in maintaining the tradition of validation of scientific literature.

5.2 SUBJECTS UNDER STUDY

Reviewing the literature on the use of periodical it has been revealed that a good number of studies have been done in the field of Physics, Chemistry and Math's. These have been discussed in subsequent sections.

6 PHYSICS

A number of studies have been conducted to look in to information sources, channels of information communication, and use of periodical among physicists. Few of those pertaining to use of periodicals are AIP study, Hooker, Fussler, Flowers, Bromley Herner and Herner, Chen, Allen, King and Roderer.

6.1 One common feature, which has emerged out of these studies, is high value placed on primary or archival literature as a source. The other highly valued sources with little differences in order are semi-formal publications (preprints or unpublished material), oral or personal communications in meetings and conferences'. Reference materials are least important to

physicists. For physicists at Harvard and MIT, according to Chen, the conference and meetings and formal oral communications with fellow scientists are more highly considered as sources of information. As moravcsik, has noted "The professional grapevine often formulated in pre-prints distributed to workers in a subfield, is so well developed in physics that one rarely sees a paper published in a major journal that one had not learned about some months previously through pre-prints, over the telephone, at meetings, or from seminars or colloquium speakers".

6.2 As in most scientific fields, the literature of physics follows the general pattern of the greatest use falling to a relatively small core of periodicals. In a study of use of physics periodicals in MIT library, Chen found 90% of the use from 49 journals (out of 220 titles in physics). Anthony, East and Slater State that 60% of the use of physics articles came from 124 journals as per 1964 Physics Abstracts record.

6.3 Chen finds that physicists generally scan from one to six periodicals per week. This figure is lower than those reported by Tornudd in 1958, which says academic physicists read 7 to 10 periodicals a week. Herner reported that scientists regularly scan on average periodicals a week with few scanning less than five. Chen feels that this difference may be because of the changing structure of scientific literature during last decade, the proliferation and availability of current awareness publications such as Current Contents and various "SDI" services and the trend towards greater specialization among scientists.

6.4 One interesting feature of physicists' use of library periodical collection is a greater tendency to browse as compared with other scientists. A study of University of Pittsburgh by Flynn indicated that physicists accessed the periodical collection through browsing and about 68.6% of the time, and for locating a specific reference they spent 31.4% of the time. Further, Browsing is overwhelmingly heavies for the newer material and leads to useful information as cited references.

6.5 As with the scientific literature in general, the most recent material is most heavily used. The study by Midorikawa calculated the half life of physics journals 5.64 years determined on the basis of citation analysis in a sample of 74 physics journals. This corresponds well to Chen's determination of half-life of 5.5 years based on the use of physics journals in a library. Midorikawa found that letter journals had predictably shorter half-life and that it varied by subfields.

Use of English language journals dominates the physics literature. Predominance of English has led Ziman to note 'It is well known that a large proportion of the technical literature of physics is written in mixture of two international languages bad English Algebra'. Chen's study of US academic libraries found that 95.3% of the physics journal is to English language journals.

6.6 The physicist's use of on-line searching is not much. The Quinn study of 1985 of non-academic physicists indicated that 41% of physicists never use on-line database, either personally or through an inter-mediatory and of the remainder, 34% had personally done online searching and 46% had used an inter-mediatory with 20% having used both methods. Curiously, there seemed to be no significant correlation between the age of physicists and their use of online literature searching. Chen in 1974 found that scientists do not really want to use these newly developed tools themselves, yet they do feel that the presence of new technological applications in the library would enable libraries to provide better and faster service.

7 CHEMISTRY

Chemistry has been the subject of attraction for many scholars from the very beginning. Perhaps 'use studies' had their origin in chemical literature with the study conducted by Gross and Gross. Fussler, Brown, Halbert and Ackoff,

Flowers, Garfield. Studies done by chemical information review committee and by Davis gave interesting results.

7.1 Use of chemical Literature differs in terms of role and the type of chemical scientist. According to Grogan an academic chemist is conservative in his attitude towards the form taken by the primary literature and is concerned to maintain its standards. He makes little use of patents or the mechanized method of information retrieval, whereas the interest of industrial chemists in 'patents' is great. Fussler also agrees that the use of chemical literature by petroleum chemists is quite different than that of chemists working in nutrition. A study by Maizell shows that creative chemists use the literature more than less creative chemist and 'creative' chemists spend more time reading the literature.

7.2 Chemists have the reputation of being the most literature conscious. It is the secondary sources such as handbooks, reference books, data books, tables and dictionaries, etc. are most commonly used by chemical scientists. Flowers identified that chemists show much more regard for 'abstracts' than do physicists and for chemists abstracts are most important source of information, and reviews, meetings and correspondence are the best vehicles for current awareness. Fussler further brings out the absence of any overwhelming agreement on type of literature used by chemists. Another sample survey use handbooks and 51.46% of population use abstracts and indexes which indicates that chemical engineers are more concerned with problem oriented communication.

7.3 Like other science subjects, in chemistry also a small core of periodicals provide major percentage of references. Fussler identifies that in 1899, 1919, 1939, 1946, 22.2%, 21.1%, 30.5% and 32.1% of the titles provided 75.5%, 68.1%, 71.2% and 68.5% of the references respectively. Garfield in 1968 said that the 90% of the significant literature in chemistry are multi-disciplinary. He further states that studies have shown that an average article in chemistry is read by 15 chemists.

7.4 There is consistent and regular decline in the number of references per serial titles in the major fields of chemistry with an average of 58.2 references per title in 1889, which declined in 1919 to 27.7% references and in 1939 to only 19.3% references. According to Fussler, the data indicate that this trend is expected to continue somewhat further.

7.5 The other characteristics of the use of chemical literature identified by different surveys is that the chemists are comparatively less dependent on the literature of other subjects.

7.6 The high use of periodicals published by societies is another important factor. American Chemical Society is the leading published which contributes most of the periodicals towards readership in chemistry. This trend is quite old in chemistry.

7.7 Further, chemists depend heavily on locally produced material and of their own language R.A. Davis survey of US engineer's showed interesting results that the material published outside United States was used by 30.71% of engineers and 22.14% engineers used translations. Garfield also identified that Russian and Japanese periodicals probably cite other Russian and Japanese periodicals more frequently than periodicals in other languages. Louttit has analyzed the citation in chemistry periodicals in English, German and French languages. In his analysis 79% of the citation in English periodicals is to English references, while only 23% of the citations in German periodicals are to English references. Each language group is biased towards the citation of references in its own language'.

8 MATH'S

Studies done on use of periodicals in Math's are not many and therefore, one has to depend on data of studies in the field of mathematical sciences. A few studies have been done in math's are by Brown, Bartels, Martron Janos, Nagappa and Maheshwarappa, Mcgregare.

8.1 An examination of the list of periodicals used by Mathematicians indicates that a mathematician in his research is largely dependent on periodicals which a research library usually classifies in Math's, operation research, Computer science, algebras and arithmetic's. Therefore, maths is comparatively less independent biological science and is closely affiliated with other sciences. Brown analysing the citations in math's periodicals identifies that out of 109 most cited serials in maths, 55 are classified in math's, 30 in operation research ; 15 in statistical sciences; 8 in computer science; and 1 in algebra.

8.2 Because of the delay between research experiments and publishing of the findings which at times is more than a year- computer scientists or mathematicians depend less on published literature for keeping update with the information in their field. According to Mcgregare for computer scientists of mathematician's informal communications with invisible colleges serve as a primary means of keeping current.

8.3 Among the published sources of information, the periodicals are the primary means of formal communication in computer science and so in math's. most of the scientists subscribe to a core set of specialized and general scientific periodicals. Often through their membership in appropriate societies. King in response to "where do you find out about useful journal articles" found the following breakdown of sources - 36% from periodicals which subscribe, 14% from reprints and preprints sent by colleagues; 33% from references in bibliographies of articles; 13% verbal references from colleagues; 4% from indexing and abstracting services comparing with scientists in computer science who reported that 21% of their references are from personal subscription and 20% are drawn from indexing and abstracting periodicals.

8.4 Brown's citation study in 'scientific serials' reveals that Maths is also compact science like other physical sciences. Analysing the citations in the literature of maths, brown identified that 250 periodicals in maths receive 5,500

citations whereas in chemistry 275 periodicals receive 9,518 and physiology 299 serials receive 5,984 citations. On the contrary the study done by Bartels shows that maths is comparatively a compact science. Bartels by analysing 43,200 abstracts in the field of 'Phytometrical Journal' reached the conclusion that 1/3 of the abstracts appear in only 15 journals.

8.5 In maths the use of periodicals is not so concentrated to the recently published volumes. According to Brown 49.7% use of periodicals are to the volumes published during the last decade whereas in Physics it is 75.6% and in physiology 61.6%. Keeping in view the relevance of old periodicals and books to current research, maths can be considered a computer science. Citations to the volumes of periodicals published before 1904 is 4% compared with Physics 0.5%. However, according to Brown in his use of literature before 1904.

8.6 On-line services SDI services are especially popular with computer scientists and mathematicians. Study done in United States identified that the three most frequently search database are statistical, operational research and so on.

9 USE STUDIES IN INDIA AND THEIR NEED

The flood of literature on use and user studies in foreign periodicals spurred some of the enterprising librarians in India in to similar action during late sixties and onwards. Few subjects covered are: Mathematics (Basak and Das); Physics (Dhawan and Yadav); Chemistry (R S Singh and Krishan Kumar); Microbiology (Sengupta); Biochemistry (Sengupta); Food technology (Maheswarappa and Rao); Plant physiology (Nagappa and Maheswarappa); Phytochemistry (Auluk, Jain and Kochhar, Sengupta). Ranking of periodicals by citation and a few bibliometric studies have been done by Arunachalam and B K Sen. In most of the above mentioned Indian studies the stress is either on 'Use of periodical' or on 'bibliometrics'. In some of these studies the methodology of questionnaires supported by interview has been used and some

have used observation method as well. A few have used citation technique and analysis of loan records.

These Indian studies lack broad coverage, and comparison. Some constitute only brief reports. Moreover, methods used to collect data have been found inadequate. In most of the studies only one indicator (in isolation) of use has been used. Often samples have not been selected with a view to generalization. Thus, it is not possible to evaluate critically the reliability of data, as well as the validity of data and there is a need of vigorous statistical treatment based on many indicators.

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CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

1 INTRODUCTION

Research design is a framework to determine the order in which data for a particular study has to be gathered and analyzed. It is, therefore, a plan or a blue print or a guide for data collection and analysis that aims to combine relevance of research purpose with economy in procedure.

The present study aims to examine the **“Availability and use of Periodical literature in the field of Physical Sciences in University of Delhi and Jawaharlal Nehru University Library: A Comparative Study”** the methodology, therefore, is concerned with selection of libraries according, therefore, is concerned with selection of libraries according to a certain criteria, identification of indicators of use, selection and choice of sampling techniques and also that of the data collection, as well as of analyzing the same. Finally decision about the method of presentation of data with a view to make the presentation more meaningful.

2 SELECTION OF BOTH UNIVERSITY LIBRARIES IN DELHI

With a view to identify libraries to be included in the study there are six universities in Delhi, but this study is limited to the two universities namely University of Delhi (DU) and Jawaharlal Nehru University (JNU) because they have a storage collection and are Central Universities. Further, a list of parameters was drawn and these include: special areas of document collection, size of document collection, number of scientific periodicals acquired, library membership, library budget and the year of establishment, and a brief questionnaire base on above parameters was canvassed to libraries given in the list to collect data.

The selection of libraries in the first instance was done on the basis of availability of users and collection in all the three subjects under studies viz. Physics, chemistry and maths. However, it was found that CSL and JNU keeping in libraries having two or more subjects under study in respect of users, and document collection and periodicals collection have been selected for study. In addition they also conform to the parameters chosen for large size libraries, such as the total strength of collection being more than 11 lakhs, documents with a book budget of more than Rs. 5 lakh, above 200 libraries membership and having been established before 1980. In view of these factors both university libraries have been chosen for study. These are:

1. Central Science Library, (CSL) University of Delhi;
2. Jawaharlal Nehru University (JNU) Library.

3 LITERATURE SURVEY

Literature survey involves review of literature on the problem under investigation. It helps in clarifying the problem and making available the results of the work already done along with methods used. The resources generally used for reviewing the literature are both primary and secondary like periodical articles, indexes, abstracts, reference books, yearbooks monographs, and other official records. Literature survey in the present study has been used

To review the literature published during the last 4-5 decades on the use of documents, information seeking behavior, and research methods used for such a study; to supplement the data obtained by questionnaires to librarians of the both university libraries under study.

As a prelude to the study, the review of literature through literature survey has been done. Library and Information Science (LISA) and Library Literature were scanned manually for the last twenty-five years and a bibliography of relevant articles was prepared. The abstracts of relevant as well as most useful articles were prepared after studying them. These abstracts were

divided further, with in the framework of the objectives of the study into various sections. With a view to get comprehensive information on the subject, a second review of literature was also made.

4 SELECTION OF RESEARCH METHODS

The task of data collection in research methodology begins after the problem of research has been defined and the research design chalked out. In dealing with any problem of real life, it is often found that data at hand are inadequate, and hence, it becomes necessary to collect data that are appropriate. There are several ways of collecting the appropriate data which differ considerably in context of money costs, time and other resources at the disposal of researcher.

Various methods available for research are: historical method; case study method; experimental method; and survey method.

The most suited research methods for the present study are historical method and survey method. The former is useful in tracing the history of the institutions and later is helpful in data collection.

5 DATA COLLECTION

Data collection is not just a process of collection; it is also a process of creation – of using information in unique ways related to the purposes of the study. There is a wide variety of data collecting methods available to researchers in the social sciences; deciding which to use will depend on

The merits of each method of research having been examined, it had been decided to use survey method for data Collection. In order to decide on different survey techniques to be used for data collection, brief advantages and disadvantages of various, survey techniques used in the present study are given below:

5.1 QUESTIONNAIRE TECHNIQUE

Questionnaire is one of the most popular and favored survey techniques to obtain data directly from target population. It involves listing or grouping of written questions which a respondent is to answer. It aims at standardized results gathered from a large and widely scattered group of people. This method supplemented by an 'interview techniques' helps to increase the response rate as well as avoidance of ambiguity in the questions, if any. Thus, interviews has proved to be much helpful infilling the gaps in the data collected through questionnaire as well as in identifying the changing trends, interests of users, and evaluating library services and librarians attitude in encouraging use. Moreover, it is not limited to the statistical data of library and permits direct feed back from users.

Factors against using questionnaires for user's opinion are low response, subjectivity indicating more of individual interest, and difficulty in analysing and interpreting date.

5.1.1 Designing Questionnaires

Two sets of questionnaires have been designed to collect data for the present study, one for the librarians of the libraries under study and the other for users i.e. scientists. Librarian's questionnaire is aimed to get data on development of the library resources, and services provided by the library, identification of most used libraries, etc, whereas users' questionnaire i.e. the one administered to scientists is aimed to collect data on their preferences for different types of reading materials, helpfulness of library services in use of periodicals, and usefulness of periodical as viewed by the scientists. The questionnaire thus designed provides multiple choice questions, yes or no type of questions, and measurement of opinion 3 and/or 5 points scale questions. Every question has been so framed that it should be easy to fill up the information and take little time of the user. Questionnaire draft was subjected to pilot survey as explained in the next section.

5.1.2 Pilot Survey

Both the questionnaires have been pretested through a pilot survey. In the case of users' questionnaire pilot study has been conducted by taking 2% of the sample of the total population. The scientists were requested to fill up the questionnaire on the spot. The queries and other ambiguities in language, style, etc. were clarified and thus the questionnaire had been modified. The Questionnaire to be canvassed to the librarians was also pretested, in Central Science library, University of Delhi and thus finalized.

5.1.3 Administering The Users' Questionnaire

After finalising the users' questionnaire and before canvassing the same to the scientists, a register of total population as well as random sample of the population was prepared. The random sampling having being done with the help of users' in each category and in each library and on the basis of the size of the sample. The number of the sample was accordingly chosen and the questionnaire was canvassed. The register has been used to note down the total number of questionnaires given to the scientists and mark against their names the date on which the questionnaire is to be received, and if scientists are unwilling to fill up the questionnaire the date of appointment for interviewing them was noted. Initially 849 questionnaires administered to the scientists. Details of response can be seen in Table below:

**TABLE 3.1: SAMPLE SIZE OF USERS COVERED IN BOTH
UNIVERSITY LIBRARIES IN DELHI**

S.No.	Name of the Library	Population	Questionnaire		Percentage of Sample Analysed to the Population
			Admin-istered	Responded	
1.	CSL(DU)	832	268(32.21)	179(66.79)	21.51
2.	JNU	122	82(67.21)	59(71.95)	48.36
	Total	954	350(36.69)	238(70.00)	24.95

5.2 INTERVIEW TECHNIQUE

Interview technique has been used in the present study as a supporting technique. The technique has been use to supplement the data obtained through the questionnaire as well as for those respondents who were unwilling to fill up the questionnaire.

5.3 OBSERVATION TECHNIQUE

This technique implies the collection of data by way of researcher's observation, without interviewing the respondents. The data obtained relates to what is currently happening and is not complicated by either the past behavior or future intentions or attitudes of respondents. This method is no doubt an expensive method and the data or information provided by it is also very limited. This is only the method which is most commonly used specially in studies relating to behavioral sciences and is not suitable in inquires where large samples are concerned.

There fore, in the present study this technique has been used to collect data on in library use.

CSL (DU) & JNU LIBRARIES

CSL (DU) & JNU LIBRARIES

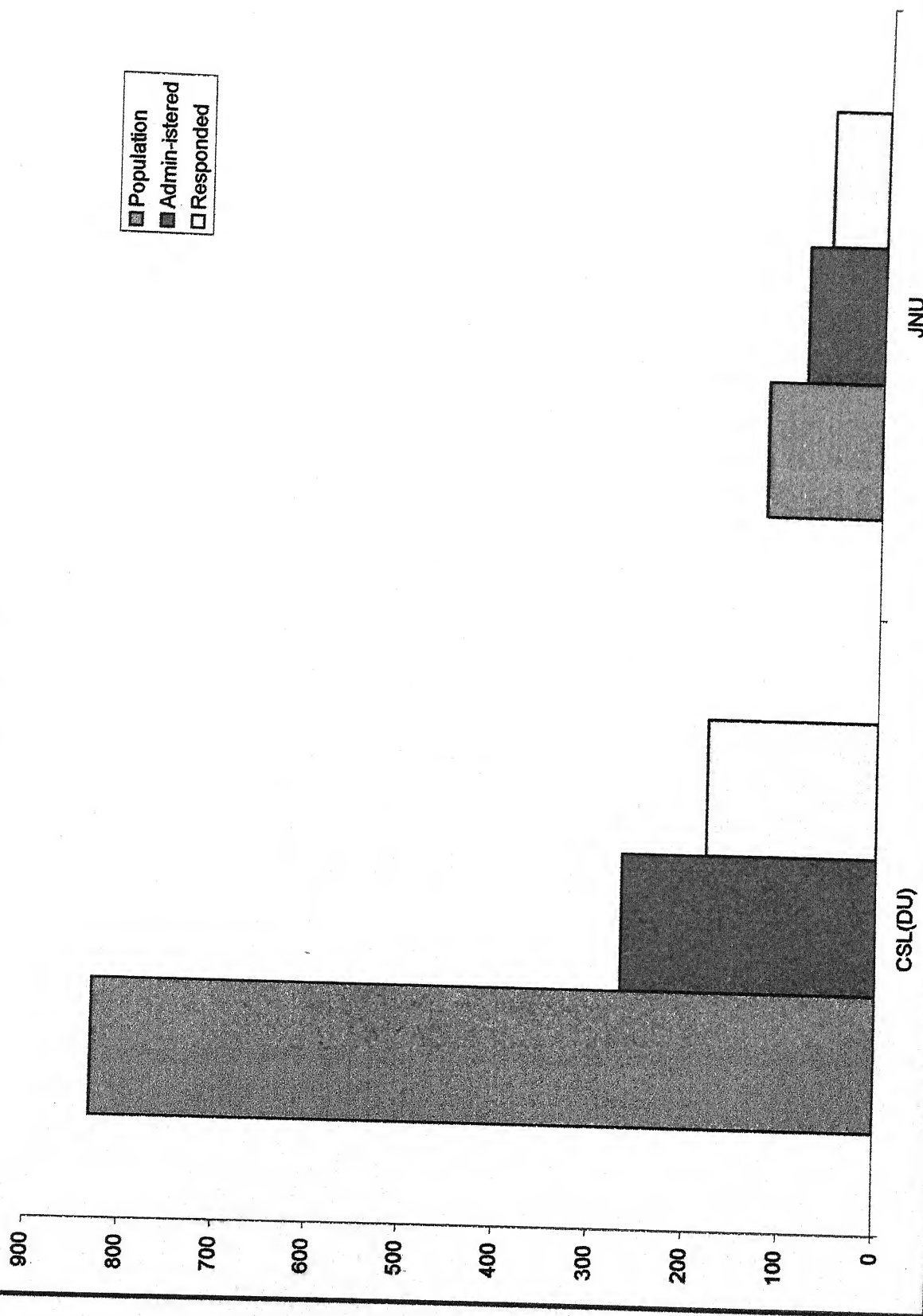
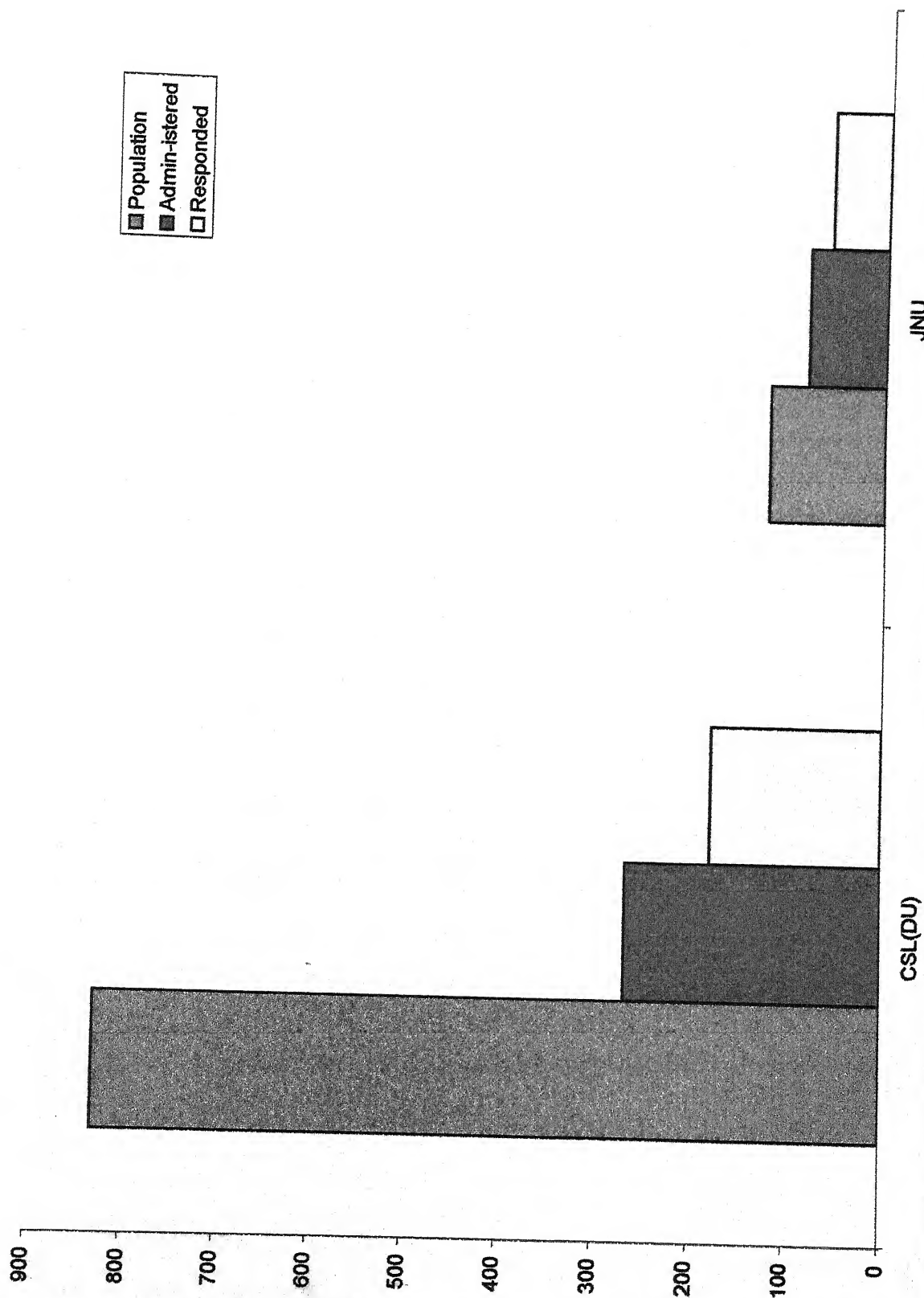


CHART SHOWING THE SAMPLE SIZE AND SCIENTISTS RESPONSE IN CSL (DU) & JNU LIBRARIES



6 INDICATORS OF USE

The literature published so far on use of documents in general, and periodicals in particular, which has been, reviewed in Chapter 2, has revealed that the following indicators could be used for the study: (i) citation study (ii) In library use, (iii) users opinion survey, (iv) circulation as well inter library loan records, (v) photocopy use (vi) coverage of periodicals in union lists and holding records, and (vii) number of items annually published etc. The last two methods have not been used in, this study on account of the following reasons:

- Union lists/catalogues cover limited number of periodicals of any particular library and give complete holdings of that library without revealing their usefulness. They also generally do not include material not deemed worthy of permanent retention.
- Further, Union lists/catalogues do not give any allowance for the number of relevant articles in a periodical which may affect the use frequency of a particular periodical in a particular library.
- The analysis of use of periodicals on the basis of number of items annually published in the periodicals has been considered inadequate because the average readership of published items varies from library to library as well as from one field to another.

The review of literature has also revealed that a single indicator is not sufficient to help in studying the pattern of use of periodicals. It has, therefore, been decided to use more than one indicator in the present study. The following indicators have been used to study the use of periodicals by scientists:

- 1 Citations;
- 2 In-Library use;
- 3 Photocopy use;
- 4 inter-library-loan records; and
- 5 Assessed use (using Questionnaire)

Each method with its limitations has, been explained in the following sections.

6.1 CITATIONS STUDY

Citing earlier literature is an established tradition, in the scholarly communication of scientific and, technical information. Citation offers a unobstrusive quantitative measure. Its basic method consist of counting the number of times a periodical is cited in source material and highly cited periodicals are used more than those that are little cited or not cited at all.

Despite accepted importance of citation count in finding out the 'use', citation studies are not away from criticism. The citation of a periodical is influenced by the its age, frequency, number of citable sources published in a periodical, its coverage in secondary sources, its accessibility to users, reputation of the author, language of the author, and national as well as international research trends. It also disregards the fact that much that is used is not cited and that is cited is not used. Moreover, a series of complex social, Psychological, bibliographical factors intervene between intention of the author to acknowledge precedent work. Above all, the low frequency of citation of a periodical does not necessarily, effect low intrinsic quality of the periodical and the articles are sometimes, cited for reasons other than their quality and relevance.

Garfield, Perhaps because of these reasons said like one scale on a monogram, it citation studies must be used along with other scales, to obtain anything useful or meaningful. It is in this context that the present study has preferred not to use citation counting in isolation and in conjunction with other indicators.

6.1.1 Data Collection

6.1.1.1 Source Material Used For Citation Counting

What should be the source material for citation count?' is a matter of debate in literature. References cited in primary periodicals are most commonly used as source data. Brittain and Line have concluded that if large number of base volumes is used for data gathering it could yield valuable results. Brown and Hawkins preferred to use secondary sources like 'Chemical Abstracts Condensates' etc sengupta used citations in annual reviews as source data.

The selection of source material used to count citation has been done with due care. Since, taking one standard periodical as source item denies the validity of random sampling and the coverage of secondary periodical is defined by its editorial policy and is often subject to linguistic and geographical preferences and limitations, it has been decided to use varied sources. The present study makes use of 20% sample using following source materials by random sampling technique.

- Articles published in periodicals by scientists;
- Project reports submitted by scientists in institutions and organizations under study;
- M Phil and Ph.D theses submitted to the and organizations under study; and

The time period of source material, used for citation analysis has been limited to 5 years i.e. from, 2000/01 to 2004/05 as the sources containing the data for the year 2004/05 were not available. The details of information about the scientists published work have been obtained through questionnaires as well as from the annual reports, library catalogues, yearbooks of the concerned institutions and other publications.

6.1.1.2 Recording Of Data

The citation of periodicals have-been recorded on 5" × 8" cards. The information recorded includes title of the periodical, year of starting, frequency, publisher's name and place of publication.

6.2 IN LIBRARY USE

'In library use' has been defined and rated as a valuable tool to study 'use'. The techniques used in this method include monitoring reshelfing of periodicals; insertion of data slips in individual volumes, breaking of artificial seal, etc. The most used method is 'monitoring reshelfing of periodicals

The limitations of using this indicator alone are: (i) that it provides data for a limited range of periodicals used only by the readers visiting the library; (ii) absence of 'weighing factor' to give a value to each use; (iii) danger of loss of use data due to reshelfing of periodicals.

By readers themselves, (iv) Use of a periodical simultaneously by more than one reader even before its being reshelfed, (v) a possible bias in time and period selected, and (vi) above all it reflects only successes and does not include failures. Because of these factors, the extent to which 'in library use' represents total use is controversial. In view of these factors this method has been used along with other methods.

6.2.1 Collection of Data

The recording of data for 'in library use' the source material used consists of periodicals, as defined in the scope in the field of Physics, Chemistry and Maths received by the libraries under study. This is taken care by data slips and presence of the investigator.

The study of work flow in the library shows that it would be best to record such uses from the reading room table, or from the trolleys or from the

collection boxes which are meant to keep the periodicals after use. The data has been recorded from these before the shelving is done by the library staff. The use has been recorded on the days mentioned in the Table on three times a day during the period of study i.e. 9.30 a.m., 1.00 p.m. and 5.00 p.m.

TABLE3.2: Time Period of 'In Library Use' Data Collected in Both University Libraries

Month/Year	Libraries	
	CSL(DU)	JNU
Feb'2005	1 st Week	2 nd Week
March 2005	2 nd Week	3 rd Week
April 2005	3 rd Week	4 th Week
May 2005	4 th Week	1 st Week

6.3 PHOTOCOPY REQUESTS

Photocopy requests used as an indicator in the present study consists of recording of periodicals from which the articles have been photo stated during the academic year 2003-04 and 2004-05. It is assumed that the articles so requested by the users have been photostated for use.

The data for this indicator has been collected from the request forms or registers (on which the request for photocopy is made). Where Photostat work is got done from an out side agency, the issue record (for the purpose) have been taken as source material.

6.4 INTER LIBRARY LOAN

This is yet another indicator which is helpful in studying the use pattern of periodicals. Inter Library Loan helps to know the use of the periodicals not available in the library. The use of inter Library Loan records alone to identify

total use has been criticized because of statistical validity of a small sample. Moreover, inter library loan records are available for an individual library or the libraries of a geographically limited area and may not be representative of all libraries.

The recording of data for this indicator has been done by using the files, or register, maintained for inter library loan requests by the library. The help of librarian and the library staff was sought and data was collected on 5"×3"slips. The period covered is academic year 2002-03 and 2003-04 because the records of previous years were not available.

6.5 ASSESSED USE

The other indicator used to identify use of periodicals is users' opinion through questionnaires. Since library users are the actual Users of library and its collection, knowing their view is an important aspect in identifying use. By this indicator an effort has been made to identify (a) Periodicals used by Scientists (may or may not be received by the library),(b) helpfulness of library services in promoting the use of periodicals, (c) and libraries used by scientists for using of periodicals. The details about its design etc. have been discussed in previous sections.

7 DATA ANALYSIS

The analysis of data has been done by using simple statistical techniques the data has been presented with the help of tables and diagrams. It has been analysed using methods of: (i) Percentages, (ii) Averages, and (iii) Ranking. The hypotheses formulated for this study have also been tested. The finding and conclusions are based on the analysis and interpretation of data.

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CHAPTER 4

DATA COLLECTION AND ANALYSIS

1 INTRODUCTION

Chapter 4 has been divided into three parts 4A, 4B and 4C. Part 4A deals with data collected through the questionnaire to librarians of both University Libraries under study. Part 4B is concerned with questionnaire to the scientists i.e. users and has been further subdivided into four parts BA, BB, BC and BD. Part BA – BC deals with the analysis of data collected through the questionnaires to scientists i.e. users in Physics, Chemistry and Math's respectively. Part BD deals with comparison of the analysis in the earlier three parts. C part of the Chapter 4 deals with data collected on five indicators viz Citation Use, In Library Use, Photocopy Use, Inter Library Loan and Assessed Use.

The details of the sampling method and survey techniques used for data collection has already been discussed in chapter 3 i.e. 'Research Design and Methodology'. Percentages have in general been mentioned in parenthesis below the data.

PART A

QUESTIONNAIRE ADMINISTERED TO LIBRARIANS

A1 INTRODUCTION

In this chapter the data collected through the questionnaire to the librarians in selected both University Libraries have been analysed and presented in a comparative manner with a view to identify the comparative helpfulness of library facilities, collection and services in use of periodicals. Out of both University Libraries is the oldest is JNU Library (1969). Compare than

CSL (DU) in 1981 as prior to 1981 it was part of (DUL). A brief development of these libraries has been traced in the subsequent paragraphs.

A2 DESCRIPTION OF LIBRARIES UNDER STUDY

A2.1 CENTRAL SCIENCE LIBRARY (UNIVERSITY OF DELHI)

University of Delhi: When the decision to transfer the capital of India from Calcutta to Delhi was taken, the establishment of a University at the Imperial Capital formed an integral part of the scheme. But formally University of Delhi was established in 1922 (by an Act of Central Legislative Assembly) as a unitary, teaching and residential University. The original concept of unitary, teaching and residential University was gradually changed in favour of teaching and affiliating University by an amendment of the act in 1952. In 1962-67 Dr. C D Deshmukh saw the need for a second university in the South Delhi and south Delhi Campus was set up in 1972. Today the territorial jurisdiction of the University of Delhi extends over the Union Territory of Delhi and University is authorized to affiliate a college at Bhutan.

Starting from two faculties, 3 colleges and 750 students in 1922, the University today i.e. in 2004/05 has 15 faculties 60 departments, above 85 colleges, above 1000 University appointed teachers, more than 2,50,000 undergraduate and post graduate students, and more than 3,800 research scholars on its roll. During last few decades research facilities in the University have grown and today the university has six centers of Advanced Studies out of 18 in the country. These are in the subjects of Physics and astrophysics, Chemistry, Math's, Zoology, Economics and Sociology.

Science teaching has been given special attention in the University. From the modest beginning, the University science departments have become internationally renowned centers of research with well equipped laboratories and other facilities. Many specific projects given by sponsoring

agencies like Ford Foundation, UNESCO, DST, UGC and so on. have helped a lot in the growth and development of scientific research in different departments.

Physics

Late Dr D S Kothari initiated Department of Physics and Astrophysics research in theoretical physics and after 1962 there had been a phenomenal growth in experimental physics. The department now has 48 faculty members and 453 research scholars involved in teaching and research and are also working on different projects in all discipline related to physics. The research activities of the faculty in theory is spread over a large number of branches of Physics such as: Condensed Matter/ Solid State Physics, Plasma Physics, Particle Physics, Astro-physics, Nuclear Physics, Mathematical Physics, Reactor Physics, Cosmology, Nonlinear systems, Atomic and Quantum Optics and Medical Physics and so on.

Chemistry

The department of Chemistry is one of the oldest departments of the University of Delhi and is renowned as a center for advanced study in Chemistry and is carrying out more than a dozen research projects with financial assistance from UGC, CSIR, Atomic Energy Commission (AEC), Indian Council of Medical Research (ICMR), Indian National Science Academy (INSA), and Department of Science and Technology (DST), etc. Besides, research is being done at pre-doctoral, doctoral and post doctoral levels. At present there are 53 faculty members and 263 research scholars involved in teaching and research and also are working on different projects. Current research programmes in the department are being conducted, in interdisciplinary areas like, super-conductivity, Thermodynamics, Equilibrium, Metals, Phosphine Complexes, and Synthesis of different compounds, phytochemistry, photochemistry and Alkaloids as well as in the traditional areas.

Mathematics

The department of Mathematics is a key educational and research unit of the University of Delhi. The research in the Department is being carried out in the core areas of mathematics as well as multi-disciplinary applications areas. The thrust of the department is research work is being carried out in the areas of Analysis, Abstract Algebra Geometry of branch spaces, Function spaces and Applied and so on. The department has 10 faculty members and 29 researchers engaged in teaching and research.

The Library (CSL)

To support academic and research programmes of the University, the Delhi University library was established in 1922. The library started with 1,466 documents (1,380 gifted books and 86 current periodicals) has expanded over the years. Today it is responding to the needs of the rapidly increasing student's body through a process of decentralization both in campuses and in the respective disciplines, departments. In short, today the system is spread in more than 26 big and small units, excluding departmental libraries. Its major libraries are Arts Library; Central Science Library; Ratan Tata Library, Central Reference Library, Law Library and South Campus Library etc. according to the DULS annual report the system had a collection of 11,97,784 volumes on 31st March 2005 and 64,149 members with around 400 staff members on its roll.

Central Science Library came in to being in 1981 as a result of the recommendations of Ford Foundation Consultant Prof. Carl M White in 1965. During this period the Central science Library (CSL) DU with separate building and staff strength of 23, was bifurcated from main University Library, and around 1 lakh bound volumes of periodicals and 60,000 books in scientific disciplines were shifted to CSL (DU). The CSL(DU) is currently serving its 1630 registered members and caters to the needs of different science departments viz : Department of Chemistry, Department of Botany, Zoology, Anthropology and geology, etc. its carpet areas is 10,000 sq. feet.

A2.2 JAWAHARLAL NEHRU UNIVERSITY LIBRARY

Jawaharlal Nehru University

The Jawaharlal Nehru University, constituted under the Jawaharlal Nehru Act, 1966 (53 of 1966) came in to existence in 1969. its objectives as defined in the first schedule to the Act are as follows: "The University shall endeavor to promote the study of the principles for which Jawaharlal Nehru worked during his life time, namely, national integration, social justice, secularism, democratic way of life, international understanding and scientific approach to the problem of society. Towards this end, the University besides other objective shall:

- Make special provision for integrated courses in humanities, science and technology in the educational programmes of the University;
- Make appropriate measures for promoting interdisciplinary studies in the University;
- Establish such departments or institutions as may be necessary for the study of language, literature and life of foreign countries with a view to inculcating in the students a world perspective and international understanding;
- Provide facilities for students and teachers from other countries to participate in the academic programmes and life of the University.

In the light of the above, the University has been able to evolve policies and programmes which would make it a distinct addition to the national resources in higher education rather than a mere quantitative expansion of facilities which already exist. The basic units of the University are not single discipline departments but multidisciplinary schools of studies. The university has eight schools of interdisciplinary research and teaching and one specialized centre for Biotechnology. These are: (i) school of International Studies, (ii)

School of language, (iii) school of social sciences, (iv) school of arts and Aesthetics, (v) School of life sciences, (vi) school of environmental science, (vii) school of computer and systems sciences, and (viii) school of physical sciences.

Chemistry & Math's

Since JNU has multidisciplinary and inter disciplinary departments, chemistry finds its place in the School of Environmental science (SES) endeavors to study the problem of environment in an integrated manner using principles of Chemistry, Physics, Mathematics, Geology and Biology. The major research areas in chemistry are Geochemistry, Environmental Chemistry, and Biochemistry etc. SES had 20 faculty members and 128 research scholars on its roll during the year 2004-05.

Physics

School of Physical Science (SPS) carries research and teaching in Physical Sciences. The emphasis is on Condensed Matter Physics, Mechanics, Optics, Magnetism, etc. During 2004-05 SPS had 12 faculty members and 28 Research scholars on its roll.

The library

JNU Library is one of the most modern and well-equipped University libraries holding a pride of place in the University libraries of the country. JNU library was set up along with establishment of the University in 1969. It is a 9 storey tower building and has a carpet area of about 1 lakh sq. it is situated in the midst of the academic complex of the University and is the hub of all academic activities of the University. All the reading halls are air-conditioned. Most of the operations of the library have been computerized and rests of the operations are in the process of computerization. Over the years the library has grown in collection and in providing services to its constituents- the students and the faculty. The library initially was housed in four different places on the two campuses of the University in the rented premises of National Academy of Administration popularly known as NAA. The new library building was

completed in 1989 and the whole collection has been shifted in to the new complex located in the heart of the campus. The periodicals collection in science is housed in the 2nd / 3rd Floor of the new building.

A3 WORKING HOURS

The data collected on working hours of both University Libraries reveals that the CSL (DU) and JNU, being the libraries of institution of higher learning / Universities, are open on all days of week including Saturdays, Sundays, Gazetted holidays and vacations.

A comparison of working hours has been shown in the following Table:

TABLE 4A.1: Working Hours in Both University Libraries under Study

Working Hours	CSL(DU)		JNU	
	AM	PM	AM	PM
Mon- Fri	9.00-8.00		8.00-10.00	
Saturday	9.00-5.30		8.00-10.00	
Sunday	9.00-5.30		8.00-10.00	
Holidays	9.00-8.00		8.00-10.00	
Vacations				

NV = Not Valid

The analysis reveals that on normal working days i.e. from Monday to Friday JNU Library is open 15 hours in day (8.00 am to 10.00 PM) and CSL Library is open 11 hours in a day (9.00am to 8.00 p.m.) in day both university except three National holiday and Holi festival in a year.

A4 LIBRARY MEMBERSHIP

The data with regard to the membership of the both University Libraries has been presented in the following table:

TABLE 4A.2: Library Membership during the Year 2004/05: A Comparison

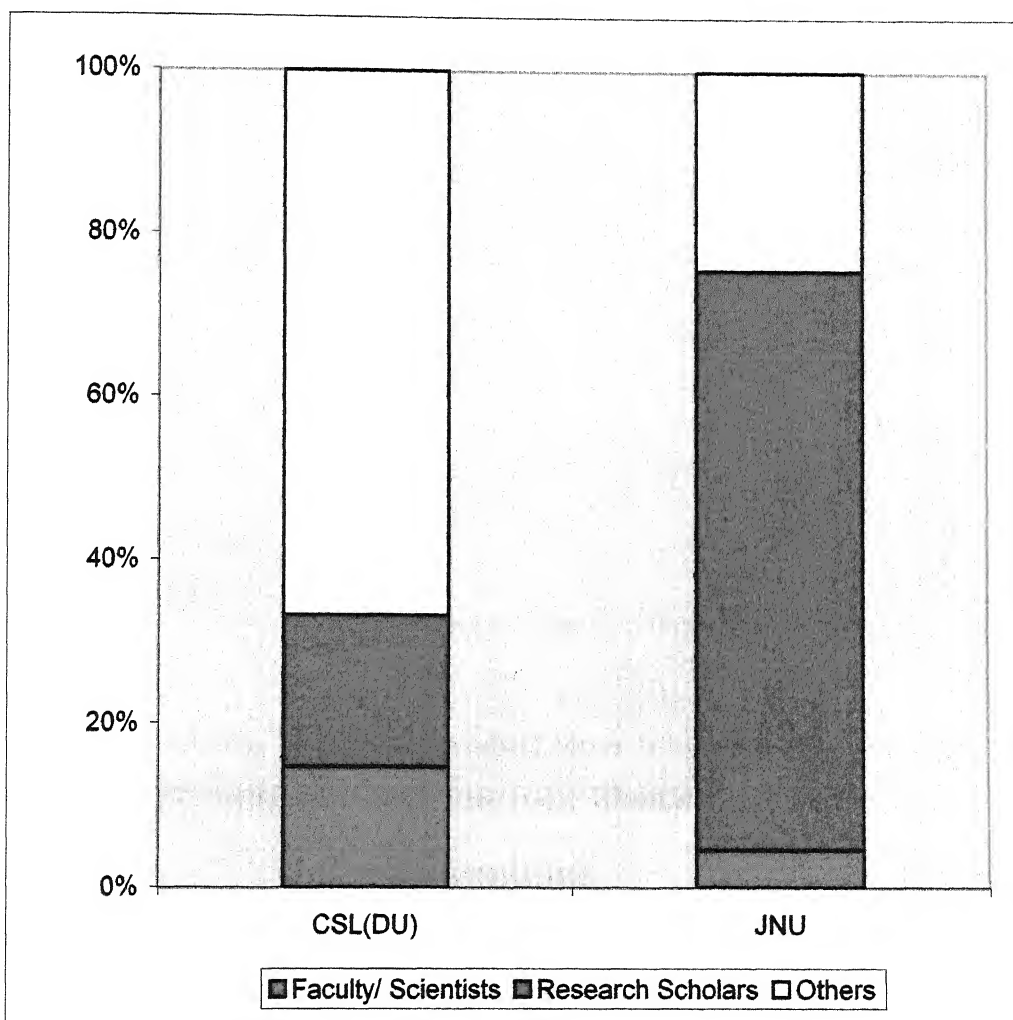
Libraries		
Types of Memberships	CSL(DU)	JNU
Faculty/ Scientists	218	435
Research Scholars	275	6812
Others	991	2346
Total	1,484	9,593

Library membership of CSL (DU) and JNU includes postgraduate students, research scholars, research fellows, faculty members and scientists in the both university. JNU tops in enrolling the maximum number of research scholar as member i.e. 6812 followed by CSL (DU) in 275 enrolled as research scholars.

A5 PHYSICAL FACILITIES

In order to have the idea of available physical facilities, which help in use of periodicals, questions like number of reading seats available, provision of separate reading room or cubicles, access to documents, etc. have been asked in the questionnaire. The data obtained on these aspects has been presented in the following table.

**CHART SHOWING THE LIBRARY MEMBERSHIP IN
CSL (DU) & JNU LIBRARIES (2004-05)**



JNU library has maximum number of reading seats for readers i.e.400 followed by CSL (DU) In 185 whereas, CSL (DU) has 90 and JNU has 40 seats respectively.

TABLE 4A.3: Comparison of Physical Facilities for Readers in Libraries under Study

Physical Facilities	CSL (DU)	JNU
<u>Seating Capacity</u>		
In Pls. section	90	40
Other Sections	135	360
Total	225	400
<u>Provision of Separate Reading Rooms/ Cubicles for</u>		
Faculty		
Research Scholars	Y	Y
Others	Y	Y
	N	N
<u>Open Access to</u>		
Documents	Y	Y
Books	Y	Y
Current Periodicals	Y	Y
Bound Periodicals	Y	Y

N = No, Y = Yes

There is provision of separate reading room cubicles for faculty members and research scholars in both university libraries.

A6 BUDGET

A6.1 BOOK BUDGET

Following table present the book budget as percentage of University budget during last five years i.e. from 2000/01 to 2004/05

**TABLE 4A.4: Percentage of Universities Budget allocated to book .
budget during 2000/01- 2004/5**

Year	CSL(DU)		JNU	
	University books and Periodicals		University books and periodicals	
2000-01	49,66,39,130	1,02,80,430 (2.07)	25,56,96,022	1,41,39,990 (5.53)
2001-02	71,48,97,220	1,46,55,393 (2.05)	38,49,06,230	1,43,95,493 (3.74)
2002-03	89,02,61,22	1,86,06,461 (2.09)	23,20,14,220	1,45,70,493 (6.28)
2003-04	96,07,31,352	1,98,87,139 (2.07)	44,94,79,360	1,47,42,923 (3.73)
2004-05	1,06,22,36,842	2,42,19,000 (2.28)	56,60,19,811	1,49,42,923 (2.64)

As revealed from the table the book budget allocation of CSL (DU) ranged between 2.07% and 2.28% of the university bought during the year 2000/01 to 2004/05 and JNU library 5.53 and 2.64% of the university bought. The percentage allocation is maximum in case of JNU library i.e. 6.28% during 2002/03.

A6.2 BREAK UP OF LIBRARY BOOK BUDGET

Allocation for Periodicals

The break up of library book budget in to periodicals, books and other reading materials, during the last five years i.e. from 2000/01 to 2004/05 has been given in the following table:

TABLE 4A.5: Percentage Allocation for Periodicals out of Book budget during 2000/01 – 2004/05: A Comparison

Year	CSL(DU)			JNU		
	Books and other	Periodicals	Total	Books and other	Periodicals	Total
2000-01	22,72,430 (22.00)	80,28,000 (78.00)	1,02,80,430	46,04,060 (32.56)	95,35,930 (67.44)	1,41,39,990
2001-02	51,11,800 (34.87)	95,43,593 (65.13)	1,46,55,393	33,32,683 (23.22)	1,10,52,810 (76.78)	1,43,95,493
2002-03	70,98,141 (38.15)	1,15,08,320 (61.85)	1,86,06,461	30,47,583 (20.92)	1,15,22,910 (79.08)	1,45,70,493
2003-04	73,68,934 (37.05)	1,25,18,205 (62.95)	1,98,87,139	31,07,713 (21.08)	1,16,35,205 (78.92)	1,47,42,923
2004-05	51,88,780 (21.42)	1,90,30,220 (78.58)	2,42,19,000	31,12,538 (20.83)	1,18,30,385 (79.17)	1,49,42,923

A7 COLLECTION

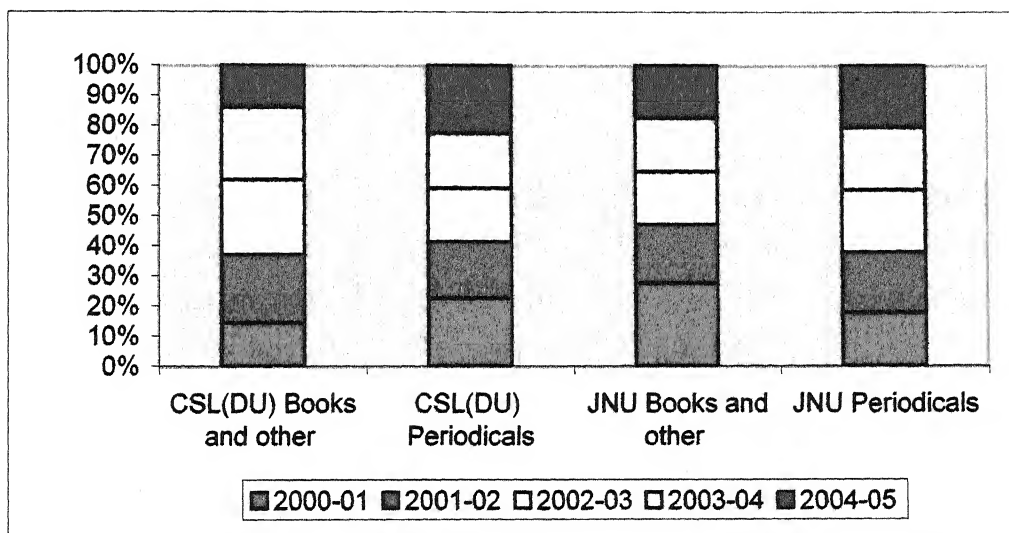
A7.1 GROWTH IN COLLECTION

The collection size split in to bound periodicals and books and other reading material has been examined in the following table with a view to know the number of documents available for use to users.

TABLE 4A.6: Size of Periodicals collection in Libraries Under study during 2004/05: A Comparison

Library	Number of Documents		
	Books and other Reading material	Bound Periodicals	Total
CSL (DU)	12,90,052(50.08)	12,86,011(49.92)	25,76,063
JNU	5,28,166(82.21)	1,14,293(17.79)	6,42,459

**CHART SHOWING THE PERCENTAGE BUDGET
ALLOCATION FOR PERIODICALS OUT OF BOOKS
BUDGET (2000-05)**



The data reveals that CSL (DU) LIBRARY has maximum number of bound periodicals i.e. 12,86,011 fouled by JNU library i.e. 1,14,293. There for, the largest no of periodical in CSL (DU) in by compound with JNU library.

A7.11 RATE OF GROWTH OF COLLECTION

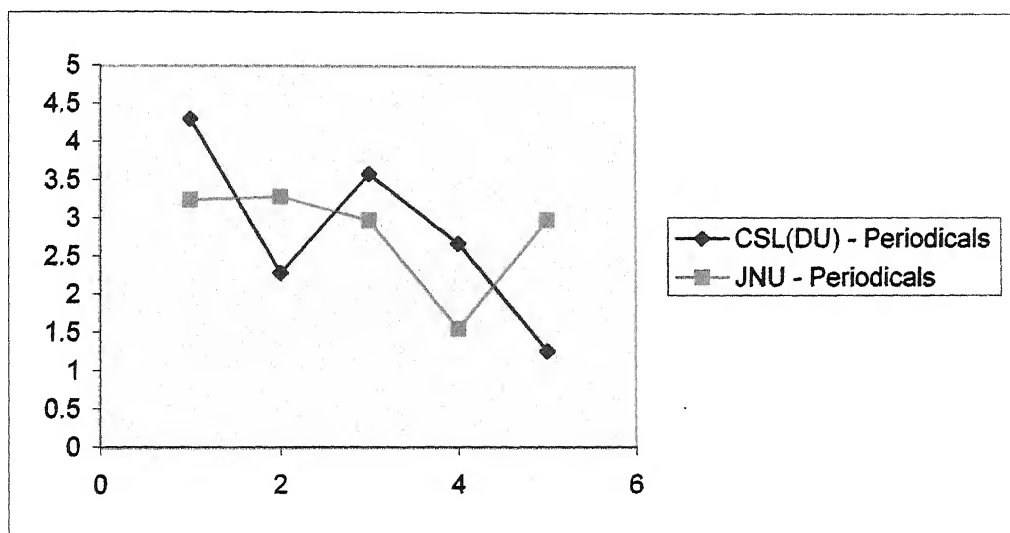
The document collection both in periodicals and books of documents is increasing in both university libraries and uniform growth pattern is not emerging in the libraries under study.

TABLE 4A7: Growth Rate in Periodicals Collection, and Books and Other Reading Materials during 2000-01 to 2004-05: A Comparison

Year	CSL(DU)		JNU	
	Periodicals	Books and other	Periodicals	Books and other
2000-01	12,86,011 (4.31)	12,90,05 (1.62)	1,14,293 (3.25)	5,28,166 (11.36)
2001-02	12,86,425 (2.29)	12,92,052 (0.85)	1,14,320 (3.29)	5,29,063 (4.46)
2002-03	12,87,091 (3.59)	12,95,335 (1.14)	1,14,410 (2.98)	5,30,360 (4.31)
2003-04	12,87,956 (2.68)	12,97,301 (0.97)	1,14,525 (1.56)	5,32,160 (3.28)
2004-05	12,88,031 (1.27)	12,98,195 (0.54)	1,14,607 (2.99)	5,35,035 (1.77)

Maximum growth rate of periodicals collection has been identified in CSL(DU) i.e. 4.31% during the year 2000-01. Whereas the minimum percentage is 1.27% during the year 2004-05. The growth rate of book collection in CSL(DU) is much less as compared to periodicals, highest being 1.62% in 2000-01 and the lowest being 0.54% in 2004-05.

CHART SHOWING THE GROWTH RATE IN PERIODICAL COLLECTIONS DURING 2000-01 TO 2004-05



Thus the growth rate of periodicals in both university libraries is higher than books during the year 2004-05.

A7.2 CURRENT PERIODICALS

The data on number of periodicals received and subscribed by the library has also been examined and tabulated in the following table.

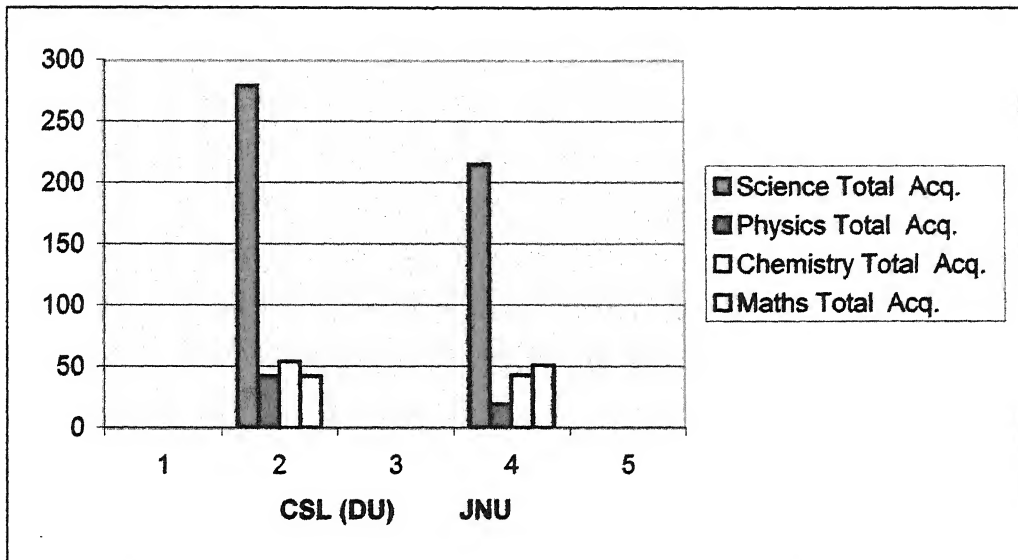
TABLE 4A.8: Number of Periodicals subscribed and received in Sciences, Physics, Chemistry and Maths during 2004/05

Libraries	Total			Science			Physics			Chemistry			Maths		
	Total Acq.	Subscribed	others	Total Acq.	Subscribed	Others	Total Acq.	Subscribed	others	Total Acq.	Subscribed	other	Total Acq.	Subscribed	other
CSL (DU)	275	274	01	279	274	01	42	42	NIL	54	54	NIL	42	41	01
JNU	1168	968	200	215	185	25	19	19	NIL	43	39	04	51	45	06

Note: others include periodicals received through Gifts/exchange or on complimentary basis.

The data in the table reveals that the JNU library tops by 968 periodicals thought subscription received during 2004/05 and Highest number of science periodicals are received by CSL (DU) and lowest in JNU library. The subject wise breakup of periodicals received reveals that CSL (DU) tops in receiving chemistry periodicals. Being specialised library of physics CSL (DU) receives and subscribes to higher number of periodicals i.e. 42 and 19 respectively. Lowest number of physics periodicals are receives by JNU i.e.19. In math's JNU and CSL (DU) both library have good periodicals collection and receive 42 and 51 periodicals respectively.

CHART SHOWING THE NUMBER OF PERIODICALS RECEIVED (SCIENCES, PHYSICS, CHEMISTRY & MATHS)



A8 SERVICES

To facilitate the use of collection, libraries provide many services to their readers. The data presented below gives the facilities and services provided for use of periodicals.

A8.1 DISPLAY OF CURRENT PERIODICALS

The display of current periodicals and latest reading material is organised by both of the libraries viz CSL (DU) and JNU.

A8.2 LENDING SERVICES

CSL (DU) does not loan out periodicals or back files, (loose or bound) to its members as a policy. However, periodicals are issued for photocopy purposes for an hour or so. JNU do not lend current issues of periodicals whereas back files can be issued to faculty members/ Researchers only. JNU library permit back volumes to be issued whereas, CSL (DU) loans out both current and back files for photocopy purpose.

Thus there is no uniformity in the lending facilities of periodicals provided by both university libraries.

TABLE 4A.9: Type of Services Provided by Libraries: A Comparison

Services / Facilities	Libraries	
	CSL (DU)	JNU
Display of Current Periodicals	Y	Y
Latest Arrivals	Y	Y
Lending	Y	Y
ILL	Y	Y
Reference	Y	Y
Bibliographical	NR	R
CAS	NR	R
SDI	NR	R
Photocopying	Y	Y
Translation	N	N

R = Regular, NR = Not Regular, Y = Yes, N = No

A8.3 INTER LIBRARY LOAN (ILL)

Inter library loan facilities are available in both university libraries. Besides having ILL arrangements with each other, CSL (DU) has this arrangement with all the libraries under INFLIBNET, DELNET, NISCAIR and ISI. Both university libraries arrange to get needed periodicals from other libraries of Delhi, depending upon the availability of materials.

A8.4 REFERENCE SERVICE

The both university libraries provide reference service to locate the documents, to search information from reference sources, and to search information from periodicals and so on.

A8.5 BIBLIOGRAPHICAL SERVICES

Both university libraries regularly provide bibliographical services. JNU providing it in anticipation, whereas, CSL (DU) give this service on demand but not as a regular service interested Researchers scholars.

A8.6 CAS AND SDI

Besides making user's aware of current periodicals and books through displays etc. regular current awareness services are being provided by JNU and publishers 'Suchika' for social scientists and gives clipping services to its users also. Maintaining press clipping of five daily newspapers provides this service. JNU gives SDI services on 'Centre' basis it is only in CSL (DU) where both these services are not provided regularly, but information is provided on request by the Researchers scholars.

A8.7 PHOTOCOPYING SERVICES

Both university libraries provide photocopying services and both are available at the rate of 50p, and 40p per exposure respectively; In both university libraries the service is available through an outside agency also contractual basis. JNU libraries give photostate. Copies of 200 to 3000 pages per year free of cost to their faculty members'/ scientists.

A8.8 TRANSLATION FACILITIES

None of the libraries under study have in house translation facilities. But both are arrangements for translation of documents through other agencies; particularly through NISCAIR (formerly know as INSDOC).

A 9 USES AND APPLICATION OF COMPUTERS

As far as use and application of computers is concerned both university libraries. Their holding list of documents has already been computerized and many house keeping functions of library like subscription to periodicals, loaning of documents etc. are also done on computers. The work of computerization of holdings JNU has already been started and CSL (DU) has been fully computerized library.

A10 PARTICIPATION IN NETWORK

Both university libraries are participating with DELNET and INFLIBNET, JNU are participating in DEVINSA also and both university libraries provide Email and Internet facilities for the scientists.

A11 OTHER FUNCTIONS

A11.1 MAINTENANCE OF UNION CATALOGUE

Both university libraries are compiling union catalogue of holding of the library system.

A11.2 WEEDING OUT OF PERIODICALS

Among both university libraries have been weeding out periodicals not in use from time to time and both university libraries weeded out periodicals which are not in a position to be mended in unusable condition.

A11.3 SHELVING OF PERIODICALS

Daily shelving of current periodicals is highest in CSL (DU) 200 and in JNU 100 whereas JNU do the shelving as per need the shelving once a day and CSL (DU) does the shelving every hour.

A12 EVALUATION

A12.1 FEED BACK

CSL (DU) have done evaluation and survey of the use of periodicals by using questionnaires method. JNU have not done any survey of this type. Whereas in CSL (DU), it is not a regular practice. As a result of such a survey many periodicals were discontinued and a few have been added.

A12.2 STEPS FOR INCREASE IN USE OF PERIODICALS

To initiate more use of periodicals seven different aspects which could contribute to increase the use of periodicals have been listed in the questionnaire and librarians were asked to rank them. A comparative analysis of the same is given below:

- Any librarian as number 1 or 2 has not ranked acquisition as a factor for increase in use of periodical. However, it has been ranked as number 1 by the librarian of CSL (DU) and number 2 by the JNU librarian.

- Extensiveness in coverage and quality in contents of periodicals has been ranked as number 1 by the librarians of CSL (DU) and number 2 by the JNU librarian.
- Physical Facilities and improvement therein has been ranked as number 1 by the librarian of number 1 CSL (DU) and number 2 by the JNU librarian.
- Frequent shelving, shelf rectification and good display Arrangement has been ranked as number 1 by the librarian in JNU and number 2 by CSL (DU) librarian.
- Better Environment for study and the librarian of JNU and number 1 by CSL (DU) Librarian has ranked research as number 2.
- Library oriented teaching has been ranked as number 1 by the librarian of CSL (DU) and number 2 of JNU librarian.
- To improve use of periodicals, the librarian of CSL feels that motivation and orientation of scientists in using literature can be an important and helpful factor, whereas, the librarian of and JNU feels good secondary services can contribute to more use of periodicals.

PART B

QUESTIONNAIRE ADMINISTERED TO SCIENTISTS

B1 INTRODUCTION

This part as stated earlier deals with the questionnaire administered to the users i.e. scientists in both University libraries under study, and in the three subjects viz. Physics, Chemistry and Maths. The sampling method has been explained in chapter 3 'Research Design and Methodology'. The questionnaire has been canvassed with a view to elicit information on different aspects like personal data of scientists, number of books and research articles published by them; purpose and frequency of their visits to the library; usefulness of different categories of documents, preferences of scientists with regard to the use of different types of documents; language, publisher and country of the origin of periodicals; scientist's awareness of services provided by the library and their rating according to their usefulness to them etc. To identify perceived use of periodicals a list of core periodicals based on the studies done abroad has also been attached to the questionnaire to enable scientists to tick the periodicals according to their usefulness to them. This list has a provision of free response type of information.

In all 350 questionnaires were administered to scientists in all the three subjects which form 36.69% of 954 scientists and 68% i.e. 238 of the administered questionnaires have been received and analysed. (These 238 questionnaires form 24.95% of the population i.e. 954 scientists) subject wise size of sample and response has been presented in the following Table.

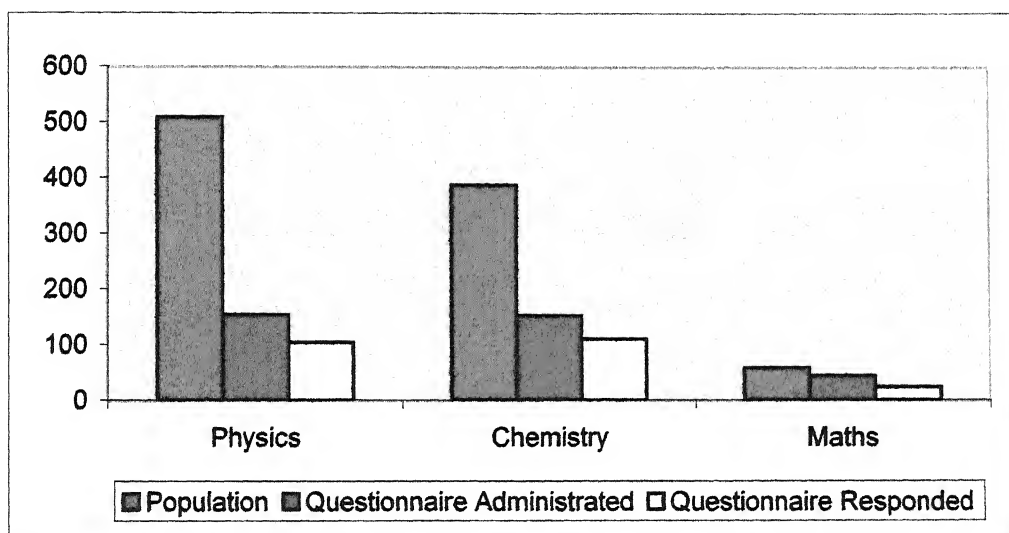
TABLE 4B.1: Sample Size and Subject Wise Response

Subject	Population	Questionnaire		Percentage Of Sample Analysed Of The Population
		Administrat ed	Responded	
Physics	509	154 (30.25)	104 (67.5)	20.43
Chemistry	387	152 (39.28)	110 (72.37)	28.42
Maths	58	44 (75.86)	24 (54.54)	41.38
Total	954	350(36.69)	238(68.00)	24.95

In Physics, Chemistry and Maths, the size of the sample is about 30.25% i.e. 154, 152 and 34 questionnaires were canvassed and out of these 104 i.e. 67.5%, 110 i.e. 72.37% and 24 i.e. 54.5% questionnaires have been received and analysed respectively. Therefore, the analysis has been done for 20.43%, 28.42% and 41.38% of the total population in Physics, Chemistry and Maths respectively in both University Libraries.

The analysis of users' questionnaires for the three subjects has been discussed in three parts BA- Physics, BB- Chemistry, BC – Maths, whereas part BD examined the data in a comparative manner.

**CHART SHOWING THE SAMPLE SIZE AND
SUBJECT WISE RESPONSE**



BA PHYSICS
BA 1 INTRODUCTION

Physics is a subject of teaching or research or both in CSL (DU) and JNU, in all 509 scientists are working in the field of Physics in both University Libraries and 154 i.e. 30.26% questionnaires have been administered to them, out of these 104 i.e. 67.53% have responded. The library wise break up of questionnaires administered and their response has been given in the following table.

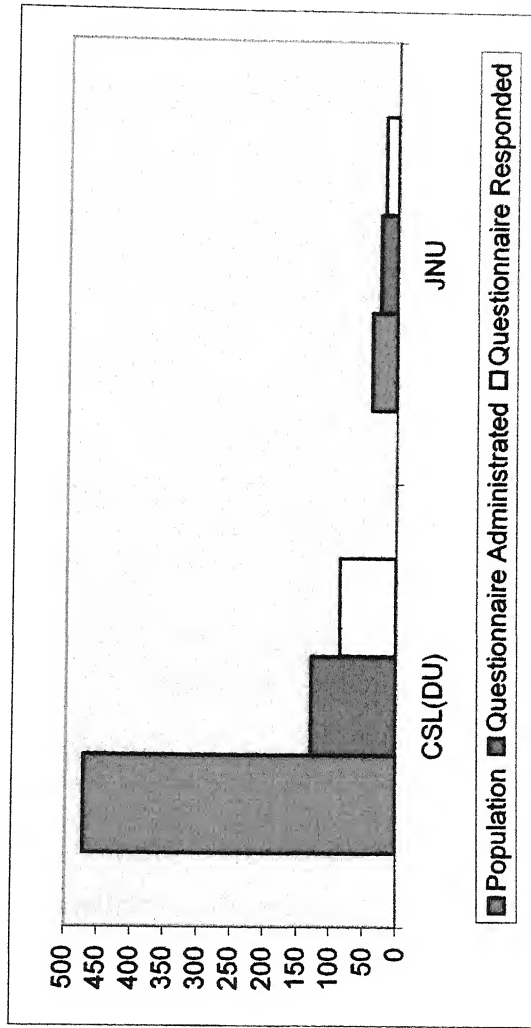
TABLE 4BA.1: Sample Size and Response Rate of Scientists in Physics

Library	Population	Questionnaire		Percentage Of Sample Analysed Of The Population
		Administrat ed	Responded	
CSL(DU)	471	129 (27.39)	85 (65.89)	18.05
JNU	38	25 (65.79)	19 (76.00)	50.00
TOTAL	509	154 (30.26)	104 (67.53)	20.43

In CSL (DU) there are 471 scientists and 129 i.e. 27.39% questionnaires have been administered and 85 i.e. 65.89% questionnaires, duly filled in have been received. and in JNU there are for 38 scientists and 25 questionnaires i.e. 65.79% were administered and 19 questionnaires i.e. 76 % have been received respectively.

Thus the sizes of the sample to which the questionnaires have been administered and the responses received vary between 27.39%, 30.26% and 76% and 67.53%.

CHART SHOWING THE SAMPLE SIZE AND RESPONSE OF SCIENTISTS IN PHYSICS



BA 2 CATEGORIES OF RESPONDENTS AND THEIR ACTIVITIES

BA2.1 CATEGORY WISE RESPONSE

With a view to find out category of scientists using periodicals scientists have been asked to indicate their status. The data on status has been sought broadly for categories i.e. faculty and research scholars. The table has been collected, analysed and presented in the following table.

TABLE 4BA.2: Status of Respondents in Different Libraries under study

Status	CSL(DU)				JNU			
	1	2	3	4	1	2	3	4
Faculty	95	35	18	(18.95)	7	4	2	(28.57)
		(36.84)	(51.43)			(57.14)	(50.00)	
Research scholar	376	94	67	(17.82)	31	21	17	(54.84)
		(25.00)	(71.28)			(67.74)	(80.95)	
Scientists			nil				nil	
Total	471	129	85	(18.05)	38	25	19	(50.00)
		(27.39)	(65.90)			(65.79)	(76.00)	

1. Population; 2. Questionnaires Administered; 3. Questionnaires Received; 4. Sample Analysed.

The analysis of data reveals that for faculty, research scholars and scientist questionnaires administered ranges between 36.84% and 25 %, 57.14% and 67.74% respectively, and the response between 51.43% and 50% for faculty, 71.28% and 80.95% for research scholars., and 63.66% and 66.67%

for scientists. Thus the sample analysed varies between 18.95% and 28.57% for faculty, 17.82% and 54.84% for research scholars.

BA2.2 ACTIVITY WISE RESPONSE

Various activities undertaken by the scientists have been analysed on the basis of the responses to the questionnaire and the same has been presented in the following Table.

TABLE 4BA.3: Type of Activities of Respondents in Both University Libraries

TYPES OF ACTIVITY	CSL(DU)	JNU	TOTAL
Teaching	10(11.76)	1(5.26)	11(10.58)
Research	72(84.71)	18(94.74)	90(86.54)
R&D	3(3.52)	nil	3(2.88)
Management and Administration	nil	nil	nil
Others	nil	nil	nil
Total	85(100)	19(100)	104(100)

The table reveals that 11.76% respondents are engaged in teaching in CSL (DU), 84.71 and 3.5 % in research and R&D activities respectively; as compared with teaching and research in JNU is 37.5% and 62.5% respectively.

Thus, in both University libraries taken together reveals that the field of activity for 86.54% respondents is research 2.88% R&D activities followed by 10.58% teaching. Respondents are engaged in other activities like editing etc.

BA3 RESEARCH OUTPUT OF SCIENTISTS

The data in the following Table reveals different types of publications brought by the scientists.

TABLE 4BA.4: Type of Publications Brought out by Respondents in Both University Libraries During 2000/01 – 2004/05

TYPES OF PUBLICATION	CSL(DU)	JNU
Books/ Monographs	9(1.78)	3(2.83)
Articles/Research papers in periodicals	241(47.53)	99(93.40)
Research Reports	220(43.39)	1(0.94)
Book Reviews	21(4.14)	3(2.83)
Others	16(3.16)	nil
Total	507(100)	106(100)

The data from the questionnaire as well as interview during last five years i.e. from 241 to (47.53%) articles / research papers have been in periodicals by the scientists of CSL (DU) by 220 (43.39%) research reports 21(4.14%), book reviews 16 (3.16%) other types of material like newspaper etc., and 9 (1.78%) books. In JNU, articles / research papers occupy major part the publications brought out by scientists i.e. 93.40% and 2.83% book reviews, books/monographs with 2.83%and 0.94% are research reports.

BA4 USE OF LIBRARY

BA4.1 PREFERENCE FOR USE OF A PARTICULAR LIBRARY

To know the preferences of the scientists in the use of the library, a question giving three choices has been asked and the response has been analysed and presented in the following table

TABLE 4BA.5: Preference of Use of Particular Library by Respondents to meet their Information Needs

LIBRARY	CSL(DU)	JNU	TOTAL
Own Institution	73(85.88)	10(52.63)	83(79.81)
Personal	6(7.06)	7(36.84)	13(12.50)
Other Libraries	6(7.06)	2(10.53)	8(7.69)

85.88% in CSL (DU) and in JNU that only 52.63% scientists prefer to use institutional library and the 10.53% percentage also prefers use of other libraries. In CSL (DU) the preference to use institutional library is followed by use of other libraries i.e. 7.06% respondents and personal library i.e. 7.06%.

Thus 79.81% respondents in both selected university libraries prefer to use one's own institutional library, followed by use of 'personal library', and 'other libraries'. The percentage being 12.50% and 7.69% respectively.

BA4.2 PURPOSE OF VISIT TO THE LIBRARY

The data on purpose of visit to the library has been analysed and presented in the following Table

TABLE 4BA.6: Purpose of Visit to the Respondents to Their Institutional Library

PURPOSE	CSL(DU)	JNU	TOTAL
To Borrow and return documents	16(18.82)	4(21.05)	20(19.23)
Light Reading	6(7.06)	1(5.26)	7(6.73)
To update knowledge	20(23.53)	4(21.05)	24(23.08)
To consult documents for research	40(47.06)	8(42.16)	48(46.15)
To consult documents for teaching	3(3.53)	2(10.53)	5(4.81)

In CSL (DU) and JNU, 47.06% and 42.16% respondents respectively visit the library to consult documents for research. In CSL (DU) it is followed by updating knowledge (23.53%), light reading (7.06%), and consultation of documents for teaching (3.53%) In JNU 19.23% respondents visit the library to borrow and return the documents, followed by updating knowledge and consultation of documents for teaching with 21.05% and 10.53% each.

The analysis, therefore, reveals that 46.15% respondents visit the library to consult documents for respondents visit the library to consult documents for research purposes, followed by 23.08% who visit the library to update knowledge 19.23% to borrow and return the documents, 6.73% for light reading, and 4.81% for teaching purposes.

BA4. 3 FREQUENCY OF VISIT TO THE LIBRARY

The frequency of visit by the scientists to their institutional libraries has been measured on a 5 point scale and the data has been analysed and presented in the following table

TABLE 4BA.7: Frequency of Visit by the Respondents to Their Institutional Library

Frequency Of Visit	CSL(DU)	JNU	TOTAL
Daily	22(25.88)	2(10.53)	24(23.08)
Twice a week	27(31.76)	5(26.32)	32(30.77)
Once a week	19(22.36)	8(42.10)	37(35.58)
Occasionally	17(20.00)	4(21.05)	21(20.19)
Never	NIL	NIL	NIL

As revealed from the data, 31.76% respondents of CSL (DU) visit the library twice a week followed by 25.88% visiting daily 22.36% once a week and

20.00% occasionally and In JNU 42.10% respondents visit once a week followed by 26.32% who visit the library twice a week and 21.05% visit occasionally.

Thus, the overall analysis reveals that respondents visit the library twice a week followed by 35.58%, 23.08% and 20.19% who visit the library once a week, daily and occasionally and no scientist in the field of physics has mentioned that he never visits the library.

The scientists against the options indicated in the table have considered Scientist visiting library 'occasionally' and 'never' as irregular visitors and the following table gives the responded provide.

TABLE 4BA.8: Reasons for Irregular Visits by Respondents to Their Institutional Library

REASONS FOR IRREGULAR VISITS	CSL(DU)	JNU	TOTAL
Far away from place of work	NIL	NIL	NIL
Far away from place of residence	1(5.88)	1(25.00)	2(9.52)
Working hours not convenient	4(23.53)	1(25.00)	5(23.81)
Collection does not meet information needs	10(58.82)	2(50.00)	12(57.14)
Environment not congenial	2(11.77)	NIL	2(9.52)

25% irregular visitors in JNU have indicated that the library is far away from place of residence and 50% have stated that the library does not meet their information needs and 25% have indicated that working hours does not congenial In CSL (DU) and 58.82% irregular visitors respectively have stated that the collection of library does not meet their information needs, whereas, 23.53% respondents of CSL (DU) have indicated that working hours are not convenient to them and the 5.88% respondent medicated that the library in for away from place of residents.

Thus the overall analysis reveals that collection does not meet information needs for 57.14% irregular visitors of the library, for another 9.52%

reading environment is not congenial, and for 23.8% working hours of library are not convenient, and for the remaining 4% the distance from place of residence is the reason for their irregular visits.

BA4.4 TIME SPENT ON READING

The time spent by the respondent in reading has been grouped in four groups i.e. less than 10 hours, 11 to 20 hours, 21 to 30 hours, and above 30 hours. The data has been condensed tabulated and analysed in the Table 4BA.9.

In CSL (DU) spend less than ten hours on reading inside the library, followed by those spending 11 to 20 hours i.e. 44.94% and 23.60% respectively, and above 30 hours by 5.88% and 22.35%, and in JNU 21 to 30 hours by 15.79% and 5.26% scientists respectively. In JNU 42.11% scientists spend 11 to 20 hours on reading inside the library followed by those spending less than 10 hours and 21 to 30 hours with 45.19% and 15.79% scientist respectively.

TABLE 4BA.9: Time Spent of Reading and Study by Respondents in Their Institutional Library

Hours per week	CSL(DU)	JNU	TOTAL
Less than 10 hours	40(44.94)	7(36.84)	47(45.19)
11 to 20 hours	21(23.60)	8(42.11)	29(27.88)
21 to 30 hours	5(5.88)	3(15.79)20	8(7.69)
above 30 hours	19(22.35)	1(5.26)	20(19.23)

Thus over all analysis reveals that 45.19% scientist spent less than 10 hours on reading inside the library followed by 27.88% scientist spending 11 to 20 hours, 7.69% spending 21 to 30 hours and 19.23% spending above 30 hours.

BA5 USEFULNESS OF DIFFERENT TYPES OF DOCUMENTS

Scientists use of different categories of documents. Has been measured on a three point scale i.e. 'most useful', 'useful' less use full and the data has been analysed in the following table.

TABLE 4BA.10: Respondent's Perception on Usefulness of Different Types of Documents

TYPE OF DOCUMENT	CSL(DU)			JNU		
	MU	U	LU	MU	U	LU
books/monographs	20(23.53)	24(28.24)	41(48.23)	2(10.53)	6(31.58)	11(57.89)
handbooks/data compilations	7(8.24)	38(44.71)	40(47.05)	4(21.05)	4(21.05)	11(57.90)
indexes/abstracts	40(47.06)	41(48.24)	4(4.70)	8(42.11)	9(47.37)	2(10.52)
periodicals	58(68.24)	23(27.06)	4(4.70)	17(89.47)	2(10.53)	nil
standards/ specifications	nil	4(4.71)	81(95.29)	nil	4(21.05)	15(78.95)
conference proceedings	34(40.00)	40(47.06)	11(12.94)	10(52.63)	7(36.84)	2(10.53)
search reports	32(37.65)	47(55.29)	6(7.06)	8(42.10)	8(42.10)	3(15.80)
dissertations/theses	nil	40(47.06)	45(52.94)	2(10.53)	5(26.32)	12(63.15)
reference literature	nil	6(7.06)	79(92.94)	nil	2(10.53)	17(89.43)
review literature	36(42.35)	45(52.94)	4(4.71)	15(78.95)	4(21.05)	nil

MU :

U :

LU :

monographs are found to be 'most useful' by 23.53% respondents in CSL (DU) and 10.53% in JNU. But for all 100% scientists these are 'useful' compared with 31.58 in JNU and 28.24% in CSL (DU).

Handbooks and date compilations have been found 'useful' by 44.71% respondents in CSL (DU) and 21.05% in JNU, compared with 47.05% in CSL (DU) and 57.90% in JNU respondents who find these 'less useful'.

In CSL (DU) 47.06% respondents and 42.11% in JNU find indexes and abstracts as 'most useful', 48.24% and 47.37% in CSL (DU) and JNU find them 'useful'.

More than 60% scientists in both University libraries find periodicals 'most useful'. This constitutes 27.06% in CSL (DU) and 10.53% JNU scientists. Percentage of scientists finding periodicals as 'useful' is highest in CSL (DU) compare with JNU.

Patents/standards and specifications have been indicated as 'less useful' by more than 78.95% in JNU and 95.29% in CSL (DU).

Conference proceedings have been indicated as 'most useful' by 52.63% respondents in JNU and 40% in CSL (DU), 47.06% in CSL (DU) and 36.84% in JNU find this as 'useful'.

With regard to research reports 42.10% JNU respondents find this 'most useful' followed by 37.65% in CSL (DU) scientists. The highest percentage of scientists who find these 'useful' is from CSL (DU) i.e. 55.29% followed by JNU (42.10%).

More than 50% scientists in both university libraries find dissertations and theses as 'less useful' where 100% scientists find this category as useful followed by 47.06% in CSL (DU) and 26.32% in JNU.

None of the scientists have indicated trade literature as 'most useful'. It has been indicated as 'less useful' by more than 89.43% scientists of both university libraries, whereas 10.53% in JNU and 7.06% CSL (DU) scientists have indicated it as 'useful'.

Review literature has been considered as 'most useful' by 78.95% scientists in JNU followed by 42.35% in CSL (DU). Who find it 'useful' followed by 52.94% of CSL (DU) and 21.05% of JNU scientists.

BA6 USE OF PERIODICALS

BA6.1 PURPOSE OF USING PERIODICALS

Multiple set of purposes have been provided to know the purpose for which current issues and back volumes of periodicals are used and scientists have been request to indicate the most appropriate answer. Analysis of the same is presented in the Table 4BA.11.

In CSL (DU), The data reveals that 41.18% respondents use current periodicals 32.94%, 17.64% and 8.24% respondents use current periodicals for browsing and updating themselves, information search, and class room teaching respectively. In JNU also most of the respondents i.e. respectively use current issues for their research work

TABLE 4BA.11: Purpose of using current and Back Files of Periodicals by Scientists.

Purpose	CSL(DU)	JNU	Total
<u>Current Periodicals</u>			
Browsing and updating information	28(32.94)	5(26.32)	33(31.73)

Research work	35(41.18)	8(42.10)	43(41.35)
Class room teaching	7(8.24)	2(10.53)	9(8.65)
Information search	15(17.64)	4(21.05)	19(18.27)
<u>Back files of Periodicals</u>			
Research work			
Class room teaching	52(61.18)	14(73.68)	66(63.46)
Information search	8(9.41)	2(10.53)	10(9.62)
	25(29.41)	3(15.79)	28(26.92)

Followed by 50% and 37.50%, 12.50% who use them for browsing and updating.

Thus, The overall analysis reveals that 41.35% scientists use current periodicals for research work 31.73%, 18.27% for browsing and updating of information search and 8.65% for class room teaching in selected both university libraries.

Back files of periodicals are used for research work by 61.18% and 63.46% CSL (DU) and JNU scientists respectively, and only 29.41% of periodicals for information search is highest in CSL (DU) compare with JNU (15.79).

From this analysis we find that 63.46% scientists use back files of periodicals for research work followed by 26.92% and 9.62% respondents who use these for information search and class room teaching.

**BA 6.2: SOURCES INITIATING RESPONDENTS FOR ACCESS
AND USE OF A PERIODICAL**

As in the case of chemistry a question on the above subject was asked from physicists also and the analysis of the data has been presented in the following Table.

**TABLE 4BA.12: Sources Initiating the Scientists for Access to a
periodical**

Source	CSL(DU)	JNU	Total
Direct Browsing	20(23.53)	5(26.32)	25(24.04)
Indexing/ Abstracting	19(22.35)	6(31.58)	25(24.04)
Citations	21(24.71)	5(26.32)	26(25.00)
Discussions with colleagues	16(18.82)	2(10.53)	18(17.32)
Attending Conference	7(8.24)	1(5.25)	8(0.08)
Invisible college	2(2.35)	nil	2(1.92)

Direct browsing by 23.53% researchers in CSL (DU) is the source initiating the researchers to use periodical. This is followed by use of Indexes and Abstracts by 22.35% citations in the articles by 24.71%, discussions with colleagues by 18.82% and participation in invisible colleges by 2.35% whereas, in JNU 5.25% researches get motivated by attending conferences and seminars, followed by direct browsing and using Indexes and Abstracts i.e 26.32% and 31.58% and citations in the articles by 26.32%.

Thus, the overall analysis reveals that 24.04%, scientists are initiated to the use and get access to periodicals by direct browsing i.e. 25% citations in the articles i.e. 17.32% discussions with colleagues i.e. 0.08%, attending conferences and seminars 1.92% and through invisible colleges in both university libraries under study.

BA6.3: PERIODICALS COLLECTION

As in chemistry user's opinion on strength of periodicals collection has been ascertained and data thus collected has been analysed in the following table.

TABLE 4BA.13: Opinion of Respondents on Adequacy of Periodicals' Collection

Adequacy of periodicals' collection	CSL(DU)	JNU	Total
Yes	31(36.47)	8(42.11)	39(37.50)
No	54(63.53)	11(57.89)	65(62.50)

The periodicals collection has been found to be adequate by 42.11% respondents in JNU and 36.47% in CSL (DU).

Thus 37.50% respondents from both libraries feel that collection is adequate whereas, 62.50% feel it otherwise.

Scientists who do not find needed periodicals in their institutional library adopt some alternative method to get periodicals. The responses to the

question on alternative methods used by them have been analysed and presented in the following table.

**TABLE 4BA.14: Alternative Methods Used by respondents for
Using Periodicals**

Alternative Methods	CSL(DU)	JNU	Total
Consulting Periodicals in other Libraries	25(46.30)	5(45.45)	30(46.15)
Borrowing Personally from other libraries	6(11.11)	Nil	6(9.24)
Inter Library Loan	10(18.52)	4(36.36)	14(21.54)
Requesting Author to Send Reprint	8(14.81)	2(18.19)	10(15.38)
Abandon the Search	5(9.26)	Nil	5(7.69)
Total	54(100)	11(100)	65(100)

As an alternative to non-availability of periodical in their own library most of the scientists, i.e. 46.30% in CSL and 45.45 % in JNU consult periodicals in other libraries. In CSL (DU) 14.18% scientists request the author to send reprint of articles followed by 18.52% who try to get periodicals on ILL, 9.26% abandon the search, and 11.11% borrow periodicals from other.

In JNU 36.36% respondents request library to get the periodical on ILL and 18.19% requests author to send the reprint.

Thus it has been found that 46.15% respondents in both university libraries under study consult periodicals in other libraries as an alternative in case of non availability of periodicals in their institutional library, followed

send reprint, 21.54% requesting library to get it on ILL, 9.24% scientist borrowing personally from other libraries and 7.69% abandoning the search.

To know, the attention paid by the library on the request of scientist for subscription to new periodicals and the reasons for not subscribing to these questions have also been asked and the responses have been presented in following tables.

TABLE 4BA.15: Number of Respondents who have requested the Library to Subscribe to New Periodicals

Requested to subscribe to Periodical	CSL(DU)	JNU	Total
Yes	31(36.47)	7(36.84)	38(36.54)
No	54(63.53)	12(63.16)	66(63.46)

Requesting library to subscribe new periodicals has been confirmed by 36.47% scientists in CSL (DU) 36.84% in JNU. Whereas 63.53% scientists of CSL (DU) and 63.16% JNU respondents have stated that library did not subscribe to the suggested periodicals.

TABLE 4BA.16: Library's Action on requests for Subscription to New Periodical's

Response to Subscription to Suggested Periodicals	CSL(DU)	JNU	Total
Yes	2(6.45)	1(14.29)	3(7.89)
No	29(93.55)	12(63.16)	35(92.11)
Total	31(100)	7(100)	38(100)

Thus the analysis reveals that in case of both university libraries under study only 7.89% scientists have confirmed the subscription to new suggested periodicals whereas, 92.11% have denied the subscription to newly requested periodical. The reasons for not subscribing to new periodicals have been presented and tabulated in the following table.

TABLE 4BA.17: Reasons for not subscribing to the Requested Periodicals

Reason	CSL(DU)	JNU	Total
Lack of Funds	27(93.10)	Nil	27(77.14)
Non Approval by Authorities	2(6.90)	3(50.00)	5(14.29)
Working/ Sharing Arrangement Done	Nil	Nil	Nil
Request not Looked in to	Nil	Nil	Nil
Others	Nil	3(50.00)	3(8.57)
Total	29(100)	6(100)	35(100)

Lack of funds as a reason to not subscribing to new periodical has been stated by 93.10% scientists in CSL (DU) whereas, authorities did not approve the request is the reason for 6.90% scientists in CSL (DU) and 77.14% scientists of JNU, lack of funds of a reason to not subscribing to the periodicals suggested by them.

BA 6.4 USE Vs FORMS OF PERIODICALS

Libraries maintain periodicals in other than printed form also. These may be in E-Journals or in CD-ROM and so on. Information with regard to their use has also been sought and the response has been analysed in the following Table

**TABLE 4BA.18: Extent of Use of Periodicals by Respondents in
Non-Conventional forms (other than Printed Form)**

Use of Periodicals in other than Printed Form	CSL(DU)	JNU	Total
Yes	78(91.76)	19(100.00)	97(93.27)
No	7(8.24)	nil	7(6.73)
Total	85(100)	19(100)	104(100)

Above 90% respondents in both University Libraries who use periodical other than printed form use E- Journals, Online, CD-ROM and so on. Out of 8.24% respondents in CSL (DU) are used printed form only.

BA6.5 USE Vs LANGUAGE

Preference with regard to language of periodicals used country of origin of periodicals and types of publisher have also been sought by asking different questions.

All respondents in the field of physics in both university libraries under study prefer periodicals in English language but few respondents read and use articles published in other languages.

BA6.6 USE Vs COUNTRY OF ORIGIN

Weightage to country of origin of periodicals has been analysed in the Table 4BA.19.

TABLE 4BA.19: Weightage given to the Country of Origin of a Periodical by respondents in Use of a Periodical

Weightage to Country of origin	CSL(DU)	JNU	Total
Yes	54(63.53)	14(73.68)	97(93.27)
No	31(36.47)	nil	7(6.73)
Total	85(100)	19(100)	104(100)

In CSL (DU) 63.53% Scientists give weightage to country of origin of periodicals, compared with 73.68% in JNU. Thus in all, 65.38% scientists give preference to country of origin of periodicals compared with 34.62% who do not give Weightage to the country of origin.

TABLE 4BA.20: Respondents' Preference for Use of Indian/ Foreign Periodicals

Country of Origin	CSL(DU)	JNU	TOTAL
Indian	5(9.26)	Nil	5(7.35)
Foreign	49(90.74)	14(100.00)	63(92.65)
Total	54(100)	14(100)	68(100)

Out of 68 scientists who give preference to the country of origin while using periodicals 7.35% prefer to use Indian periodicals, whereas 92.65% prefer to use periodicals from other countries. Response from the later category includes 90.74% scientists from CSL (DU) and 100% from JNU.

BA6.7 USE Vs TYPE OF PUBLISHER

In CSL (DU) 61.18% Scientists and 52.63% in JNU scientists which is 59.62% of total respondent have indicated that they give weightage to type of publisher for use of periodicals whereas, 40.38% scientists do not give any weightage to type of publishers. Users response according to the type of publishers have been given in the following table

TABLE 4BA.21: Weightage Given by Respondents to publisher in Periodicals' use

Weightage to Publisher	CSL(DU)	JNU	Total
Yes	52(61.18)	10(52.63)	62(59.62)
No	33(38.82)	9(47.37)	42(40.38)
Total	85(100)	19(100)	104(100)

Users response according to the type of publishers have been given in the following table

TABLE 4BA.22: Type of Publishers Preferred by Respondents in Use of Periodicals

Type of Publisher	CSL(DU)	JNU	Total
Learned Society	18(34.61)	4(40.00)	22(35.48)
Academic/ Research Institute	32(61.54)	6(60.00)	38(61.29)
Government	02(3.85)	Nil	02(3.23)
Commercial	Nil	Nil	Nil
Total	52(100)	10(100)	62(100)

Out of total 62 scientists, who give preference to the periodical by type of publisher, 22 i.e. 35.48% give preference to learned societies, 38 i.e. 61.29% prefer to use periodicals brought out by academic and research institutions, 2 i.e. 3.23% prefer to use periodicals brought out by government and 0 i.e. 0% prefer to use periodicals brought out by commercial publishers.

institutions, 3.23% prefer to use periodicals brought out by a Government publisher and no scientists prefer to use those of commercial publishers of both university libraries.

BA7 LIBRARY SERVICES

BA7.1 AWARENESS OF LIBRARY SERVICES

Different types of services provided by the libraries have been requested to indicate awareness of their provision in the library. The data so collected has been presented and analysed in the following Table

TABLE 4BA.23: Respondents' Awareness of Different Library Services provided by the Institution

Type of Service	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
Lending	76(89.41)	9(10.59)	17(89.47)	2(10.53)	93(89.42)	11(10.58)
Inter Library loan	66(77.65)	19(22.35)	10(52.63)	9(47.37)	76(73.08)	28(26.92)
Reference	73(85.88)	12(14.12)	15(78.95)	4(21.05)	88(84.61)	16(15.38)
Bibliographical	59(69.41)	26(30.59)	3(15.79)	16(84.21)	62(59.62)	42(40.38)
CAS	53(62.35)	32(37.65)	2(10.53)	17(89.47)	55(52.88)	49(47.12)
SDI	59(69.41)	26(30.59)	1(5.26)	18(94.74)	60(57.69)	44(42.12)
Indexing/ Abstracting	78(91.76)	7(8.24)	3(15.79)	16(84.21)	81(77.88)	23(22.12)
Photocopying	81(95.29)	4(4.71)	19(100.00)	nil	100(96.15)	4(3.85)
Translation	35(41.18)	50(58.82)	nil	19(100.00)	35(33.65)	69(66.35)

The lending service is known to 89.41% scientists in CSL (DU) and 89.47% in JNU, Inter library Loan Services is known 77.65% respondents in CSL (DU) and 52.63% in JNU. Awareness of reference service is indicated by

85.88% respondents in CSL (DU) and 78.95% in JNU. With regard to bibliographical services, CAS and SDI services 69.41%, 62.35 and 69.41% in CSL (DU) scientists and 15.79%, 10.53% and 5.26% in JNU respectively are aware of the service. The awareness of Indexing/ Abstracting services, Photocopying / Xeroxing have been confirmed by 91.76% and 95.29% scientists respectively of CSL (DU), 15.79% and 100% scientists of JNU respectively. With regard to the translation services 41.18% respondents in CSL (DU) and 100% in JNU respondents have given negative response.

The overall analysis reveals that in Physics 89.42% scientists of the both university libraries are aware of lending service, 73.08% of ILL service, 84.61% of reference service, 59.62% of bibliographical services, 52.88% of CAS, 57.69% of SDI, 77.88% of I/A service, 96.15% of Photocopying or Xeroxing services, and only 33.65% scientists are aware of translation services.

BA7.1.1 Lending Services

As in the case of chemistry, provision use, etc. of each one of the services has been examined separately and the analysis based on responses has been given under each one of the services. Response on the provision of lending of current as well as back files of periodicals has been given in the following Table.

TABLE 4BA.24: Provision of Lending Services for current and Back Files of periodicals to Respondents

Lending of Periodicals	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
Current Issues	36(42.35)	49(57.65)	5(26.32)	14(73.68)	41(39.42)	63(60.58)
Back files	41(48.24)	44(51.76)	7(36.84)	12(63.16)	48(46.15)	56(53.85)

Lending of current issues of periodicals has been confirmed by 42.35% respondents in CSL (DU) and 26.32% in JNU whereas 60.58% scientists of both university libraries have denied its provision. Lending of back files of periodicals has been confirmed by 48.24% respondents in CSL (DU) and 36.84% in JNU whereas, 53.85% respondents of both university libraries have denied its provision.

The recommendations of scientists have also been sought on whether the periodicals should be loaned out and the data has been tabulated in the following Table.

TABLE 4BA.25: Respondents' opinion on whether current and Back Files of periodicals be Loaned or Not

Periodicals	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
Current Issues	28(32.94)	57(67.06)	6(31.58)	13(68.42)	34(32.69)	7(67.31)
Back Files	64(75.29)	21(24.71)	8(40.00)	5(26.32)	78(75.00)	0(0.00)

In CSL (DL) 32.94% respondents and 31.58% in JNU have suggested that current issues of periodicals should be loaned out, whereas, 67.31% scientists in both university libraries have responded otherwise. The loaning of back files has been suggested by 75.29% respondent in CSL (DU) and 73.68% in JNU whereas, 25% both university libraries under study have not suggested this.

BA7.1.2 Inter- Library Loan (ILL)

No Library is self-sufficient and as a result they share documents through ILL. This is truer in periodicals. Data collected on Inter Library Loan services is presented in the following two Tables

TABLE 4BA.26: Provision of ILL Service for periodicals worth Different Libraries

Provision of ILL	CSL(DU)	JNU	Total
Yes	49(56.65)	11(57.89)	60(57.69)
No	36(42.35)	8(42.11)	44(42.31)

According to 56.65% respondents in CSL (DU) ILL services are available, whereas in case of JNU libraries i.e. 57.89%, who have stated positively. However, 42.31% scientists in both university libraries have denied provision of this service.

Scientists who have confirmed the availability of this service in their libraries have been requested to indicate the time taken by the library to obtain the periodical on ILL.

TABLE 4BA.27: Time Taken to get a periodical needed by a run through ILL.

Time Taken	CSL(DU)	JNU	Total
Less than one week	Nil	Nil	Nil
One week	21(42.86)	Nil	21(35.00)
More than one week	28(57.14)	11(100)	39(65.00)
Total	49(100)	11(100)	60(100)

In CSL (DU) 42.86% respondents have indicated that library takes one week to obtain the document on ILL where as 57.14% have indicated it takes more than one week. and in JNU all the respondents have indicated ILL loan period as more than a week.

Thus the data reveals that in case of both university libraries 65% scientist have indicated that the library takes more than a week followed by 35% scientists and no scientist who have stated that library take one week and less than one week. respectively to get are periodical on ILL.

BA7 .1.3 Reference And Information Service

The analysis of the response to the question on provision of reference services and usefulness of different type of information services like Bibliographical service, current Awareness service (CAS), and selecting Dissemination of Information (SDI) have been given in the following Table.

TABLE 4BA 28: Provision of Different Types of Reference and Information Services by Libraries

Type of Reference Service	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
To Search Periodicals	62(72.94)	23(27.06)	6(31.58)	13(68.42)	68(65.38)	36(34.62)
To search Information	49(57.65)	36(42.35)	nil	19(100.00)	49(47.12)	55(52.88)
Suggestions to Provide Reference Service	76(89.41)	9(10.59)	9(47.37)	10(52.63)	85(81.73)	19(18.27)

The searching of the required periodical is a minimal service and has been confirmed by 72.94% respondents in CSL (DU) and 31.58% in JNU whereas 34.62% scientists in both libraries under study have denied its

provision. The help provided by the library in searching specific information has been confirmed by 57.65% respondents of CSL (DU) and denied by all respondents of JNU. In all 47.12% respondents have confirmed its provision, whereas, 52.88% scientists have denied the same. With regard to their suggestion to provide reference service 89.41% respond positively compared with 18.27% respondents who have not felt its necessity and have given negative response.

The usefulness of information services has been assessed on a three point scale i.e. most useful, useful, and less useful.

TABLE 4BA.29: Respondents opinion on usefulness of Information services provided to them by Their Library

Service	CSL(DU)			JNU		
	MU	U	LU	MU	U	LU
Bibliographical Services	6(7.06)	17(20.00)	2(72.94)	1(5.26)	2(10.53)	16(84.21)
CAS	7(8.24)	22(25.88)	56(65.88)	Nil	3(15.79)	16(84.21)
SDI	Nil	12(14.12)	73(85.88)	Nil	4(21.05)	5(78.95)

In CSL (DU) bibliographical services, provided by the library have been found 'less useful' by 72.94% respondents followed by 20% respondents and 7.06% respondents who find this as 'useful' and 'most useful' respectively In JNU for 84.21% respondents bibliographical services provided by type library are 'less useful' followed by 10.53%, 5.26% respondents in 'most useful' and 'useful' current Awareness service provided by the library have been indicated as 'most useful' by 8.24% respondents of CSL(DU) and non of JNU find it

'useful'. In CSL (DU) and JNU most of the scientists I.e. 85.88% and 78.95% respectively have found SDI service provided by the library as 'less useful'

BA7.1.4 Indexing /Abstracting (I/A) Services

Scientist's opinion on the frequency and adequacy of coverage in Indexing and Abstracting services has been presented in the following Table. The data gives the mixed opinion of respondents on available (I/A) service in the library and on services provided by the library.

TABLE 4BA.30: Respondents opinion on different aspects of Indexing / Abstracting Services

Service	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
Provision to I/A Service	28(32.94)	57(67.06)	Nil	19(100.00)	28(26.92)	76(73.08)
<u>Satisfaction with:</u>						
Adequacy in coverage	6(7.06)	79(92.94)	Nil	19(100.00)	6(5.77)	98(94.23)
Frequency of publication	23(27.06)	62(72.94)	Nil	19(100.00)	23(22.12)	81(77.88)

Scientist's opinion on the frequency and adequacy of coverage in Indexing and Abstracting services has been presented in the following Table. The data gives the mixed opinion of respondents on available (I/A) services in the library and on services provided by the library.

TABLE 4BA.31: Time taken in providing a Document duly Xeroxed/ Photostatted by Library

Time Taken	CSL(DU)	JNU	Total
Less than an hour	10(11.77)	Nil	10(9.62)
1-3 hours	17(20.00)	Nil	17(16.35)

3 -5 hours	30(35.29)	2(10.53)	32(30.77)
5-7 hours	18(21.18)	10(52.63)	28(26.92)
More than a day	10(11.76)	7(36.84)	17(16.34)

The provision of Indexing and abstracting services has been confirmed by 100% respondents in 32.94% in CSL (DU) whereas, all respondents of JNU have denied its provision in the library. In both university libraries under study 73.08% respondents have denied the provision of indexing and abstracting services.

Most of the respondents from both the libraries have denied the adequacy in coverage of indexing and abstracting services. The percentage is highest in JNU i.e. 100% followed by 92.94% in CSL (DU) Only 5.77% respondents in both university libraries have confirmed the adequacy of coverage in the indexing and abstracting services.

With regard to the frequency of publication of Indexing and Abstracting services brought out by the library 27.06% respondents in CSL (DU) no one from JNU where as, 77.88% respondents from both libraries have expressed that they are not satisfied with the services.

BA7.1.5 Photocopying Facilities

The photocopying facilities are provided in both university libraries. The data on time taken for photocopying work has been analysed and presented in the following Table.

TABLE 4BA.32: Use of Photocopy services by respondents from other than their libraries

Respondents	CSL(DU)	JNU	Total
Yes	75(88.24)	19(100.00)	94(90.38)
No	10(11.76)	Nil	10(9.62)

In CSL 33.71% respondents have indicated that the library takes 3 to 5 hours to get photocopies of the required material followed by 22.47% scientists who have indicated the time taken as 5 to 7 hours, 19.10 %, 12.36% scientists of CSL (DU) have indicated this time as 1 to 3 hours and less than an hour and more than a day each.

Thus according to 24.64%, 2.27%, 20.38, 16.59% and 16.11% respondents library takes 3 to 5 hours, less than an hour, 5 to 7 hours, 1 to 3 hours and more than one day for getting the work done.

The question of using the photocopying facilities outside the library has been answered positively by 38.76% CSL (DU) 100% JNU, whereas it has been denied by 34.12% scientists in both libraries.

BA7.1.6 Availability Of Translation Service

The availability of translation service in library may contribute to enhance the use of periodicals. Thus, a question on availability of this service has been asked and almost all the respondents have denied its availability in their libraries and only.

BA8 USER'S OVERALL RATING

With a view to know the use of periodicals from the scientists of selected both university libraries the over all evaluation has been based on question like reading and study environment in the library, display arrangement of current periodicals, arrangement of back files of periodicals on the shelf, behavior of library staff competence of library staff and on the usefulness of periodicals collection.

Reading and study environment in selected both university libraries has also been assessed on three point scale i.e. Most congenial, congenial and Not congenial.

TABLE 4BA.33: Respondents Opinion on Reading and Study Environment in their Library

	CSL(DU)			JNU		
	MC	C	NC	MC	C	NC
Study and Reading Environment in the library	28 (32.94)	35 (41.18)	22 (25.88)	4 (21.05)	15 (78.95)	Nil

MC - Most Congenial, C - Congenial, NC - Not Congenial

In CSL (DU), 41.18% respondent have rated the reading and study environment 'congenial' followed by 32.94% and 25.88% as is 'most congenial' and 'not congenial' respectively. And JNU 78.95% respondents have found reading and study environment 'congenial' and 21.05%, who find it most congenial.

TABLE 4BA.34: Respondents Opinion on library services and attitude of library staff

	CSL(DU)			JNU		
	MH	H	NH	MH	H	NH
Display of Current Periodicals	20 (23.53)	35 (41.18)	30 (35.29)	2 (10.53)	14 (73.68)	3 (15.79)
Arrangement of Back files of Periodicals	26 (30.59)	31 (36.47)	28 (32.94)	5 (26.32)	8 (42.10)	6 (31.58)
Attitude of Library Staff	25 (29.41)	40 (47.06)	20 (23.53)	2 (10.53)	13 (68.42)	4 (21.05)

H - Most Helpful, H - Helpful, NH - Not Helpful

In CSL (DU) 41.18% respondents have indicated that display of current periodicals is helpful' for use of periodicals, and 23.53% have indicated it as 'most helpful' whereas, 35.29% have stated to be not 'helpful'. In JNU 73.68% respondents have stated that the display of current periodicals is helpful. In JNU 15.79% and 10.53% respondents who have indicated that arrangement of periodicals as 'not helpful' and 'most helpful' follow it respectively.

The arrangement of back files of periodicals has been confirmed as 'most helpful' by 30.59% respondents in CSL (DU) and 26.32% in JNU. 32.94% in CSL (DU) and 31.58% in JNU find the arrangement of back files of periodicals as not helpful'.

In CSL (DU) 47.06% respondents have found behavior of library staff 'helpful' followed by 29.41% and 23.53% who find it 'most helpful and not helpful' respectively. In JNU 68.42% respondents find it 'helpful' followed by 10.53% respondents for each as 'most helpful' and 'not helpful'.

Respondents opinion about the competence of library staff to give services has been presented and analysis on three points scale in the following table.

TABLE 4BA.35: Respondents Opinion on Competence of library staff in meeting their information needs

	CSL(DU)			JNU		
	MC	C	NC	MC	C	NC
Competence of library Staff	26 (30.59)	46 (54.12)	13 (15.29)	3 (15.79)	12 (63.16)	4 (21.05)

MC - Most Competence, C -, Competence, NC - Not Competence

Most of the respondents in CSL (DU) and JNU i.e. 54.12% and 63.16% respectively have indicated that the staff of the library is competent to give services to readers. Whereas, 30.59% CSL (DU) and 15.79% JNU have said that it is 'most competent'. For 15.29% and 21.05% respondents of CSL (DU) and JNU respectively the staff is 'not competent' to give service.

Overall evaluation of periodical collection has also been done on a three point scale i.e. 'most useful' 'useful' and 'not useful'.

TABLE 4BA.36: Respondents Opinion on about usefulness of periodical collection

	CSL(DU)			JNU		
	MU	U	NU	MU	U	NU
Usefulness of Periodicals Collection of Library	17 (20.00)	54 (63.53)	14 (16.47)	3 (15.79)	12 (63.16)	4 (21.05)

MU - Most Useful, U - Useful, NU - Not Useful

As revealed from the above table only 20% respondents from CSL (DU) and 15.79% from JNU find their periodical collection 'most useful' whereas, the percentage of respondents who find their collection 'useful' ranges in between 63.53% and 63.16% whereas 16.47% and 21.05% respondents of CSL (DU) and JNU find the periodical collection of their library as 'not useful' find it so.

4BB CHEMISTRY

BB1 INTRODUCTION

Chemistry is a subject of teaching or research or both in CSL (DU), and JNU, In All 387 scientists are working in the field of Chemistry in both University Libraries and 152 i.e. 39.28% questionnaires have been administered to them, out of these 110 i.e. 72.37% have responded. The library wise break up of questionnaires administered and their response has been given in the following Table.

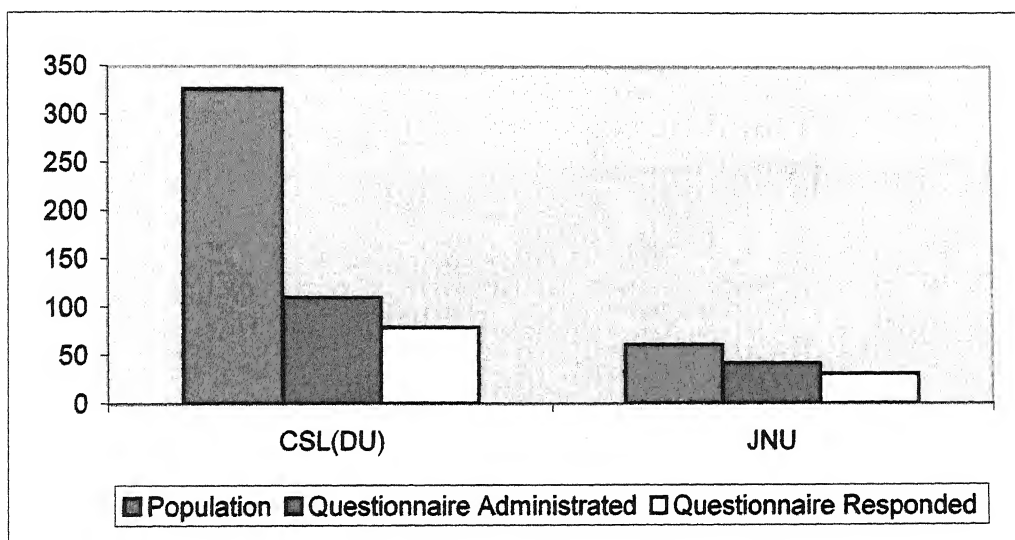
Table

TABLE 4BB.1: Sample Size and Response Rate of Scientists in Chemistry

Library	Population	Questionnaire		Percentage Of Sample Analysed Of The Population
		Administrat ed	Responded	
CSL(DU)	326	110 (33.74)	79 (71.82)	24.23
JNU	61	42 (68.85)	31 (73.80)	50.82
TOTAL	387	152 (39.28)	110 (72.37)	28.42

It would be seen that the questionnaires have been administered to about 80% of the population in Chemistry and the response rate varies between 71.82% and 73.80%.

CHART SHOWING THE SAMPLE SIZE AND RESPONSE OF SCIENTISTS IN CHEMISTRY



BB2 CATEGORIES OF RESPONDENTS AND THEIR ACTIVITIES

BB2.1 CATEGORY WISE RESPONSE

With a view to find out category of scientists using periodicals scientists have been asked to indicate their status. The data on status has been sought broadly for two categories i.e. faculty and research scholars. The table has been given under below.

The analysis reveals that the Scientists in CSL (DU) and JNU comes from two categories i.e. faculty and research scholar designated as scientists. Further, questionnaire were administered to 46.15% faculty members and 30.65% research scholar in CSL (DU) and 60.00% faculty members and 71.74% research scholars in JNU. Further has been revealed respondent 40% and 83.75% in CSL and 55.55%, 78.79% in JNU faculty and research scholars.

TABLE 4BB.2: Status of Respondents in Different Libraries under Study

STATUS	CSL(DU)				JNU			
	1	2	3	4	1	2	3	4
Faculty	65	30	12	18.46%	15	9	5	33.33%
	(46.15)		(40.00)		(60.00)		(55.55)	
Research scholar	261	80	67	25.67%	46	33	26	56.52%
	(30.65)		(83.75)		(71.74)		(78.79)	
Total	326	110	79	24.23%	61	42	31	56.82%
	(33.74)		(71.82)		(68.85)		(73.81)	

1. Population; 2. Questionnaires Administered; 3. Questionnaires Received; 4. Sample Analysed.

BB2.2 ACTIVITY WISE RESPONSE

Scientists are engaged in different activities like teaching, research, R & D, management and administration, etc. To know the correlation between the activity and use of periodicals the data has been analyzed in the following Table.

TABLE 4BB.3: Type of Activities of Respondents in Both University Libraries

Types Of Activity	CSL(DU)	JNU	TOTAL
Teaching	20(18.18)	6(14.29)	26(17.11)
Research	90(81.82)	36(85.71)	126(82.89)
R&D	Nil	Nil	Nil
Management and Administration	Nil	Nil	Nil
Others	Nil	Nil	Nil
Total	110(100)	42(100)	152(100)

The analysis reveals that from total 152 respondents in chemistry, 126(82.89%) respondents are engaged in research followed by 26(17.11%) in teaching. Libraries wise the highest percentage i.e. in CSL (DU) 18.18% and in JNU (14.29%) respectively. The highest percentage of scientists engaged in research comes from JNU i.e. 85.71% followed by scientists 81.82 in CSL (DU).

BB3 RESEARCH OUTPUT OF SCIENTISTS

The research output of scientists in terms of their published papers, books, reports etc. is related to use of periodicals. A question has therefore been asked about the number of different types of publications brought out by them during last five years i.e. 2000/01 - 2004/05. Analysis of the same has been given in the following Table

TABLE 4BB.4: Type of Publications Brought out by Respondents in Both University Libraries During 2000/01 - 2004/05

TYPES OF PUBLICATION	CSL(DU)	JNU
Books/ Monographs	11(3.59)	13(13.40)
Articles/Research papers in periodicals	261(85.29)	73(75.26)
Research Reports	33(10.79)	3(3.06)
Book Reviews	1(0.33)	2(2.06)
Others	Nil	6(6.19)
Total	306	97

As revealed from the Table the scientists of CSL (DU) have made maximum contribution in the form of articles and research papers in periodicals. It constitutes 85.29% of the total contribution followed by research reports, books and monographs, and book reviews i.e. 10.79%, 3.59% and 0.33% respectively. In JNU research papers in periodicals constitute major portion of the contribution 75.26%, and Books and Monographs occupy second position with 13.90%, followed by proceedings, research reports and book reviews which is 6.19%, 3.09% and 2.06%.

The overall analysis reveals that the average institutional literature output is highest in 85.29 publications in CSL (DU) and in JNU Publications.

BB 4USE OF LIBRARY

BB4.1 PREFERENCE FOR USE OF A PARTICULAR LIBRARY

Users' preference to use a particular library is a reflection on the collection and services provided by that library. As such Researches have been asked to indicate the preference of the library used by them. The analysis of the same has been presented in the following Table.

TABLE 4BB.5: Preference of Use of Particular Library by Respondents to meet their Information Needs

LIBRARY	CSL(DU)	JNU	TOTAL
Own Institution	68(86.08)	23(74.20)	91(82.73)
Personal	5(6.33)	8(25.80)	13(11.82)
Other Libraries	6(7.59)	Nil	6(5.45)

The analysis of both University libraries reveals that scientists prefer to use the library of their institute than any other library. The preference varies from 86.08% in CSL (DU) and 74.20% scientist in JNU prefer to use their personal library as compared with 60.33% in CSL (DU). The use of other library has been preferred by 7.59% in CSL (DU).

In all 82.73% Respondents prefer to use their institutional library. The use of personal library and other libraries is much less i.e. 11.82% And 5.45% Respectively.

BB4.2 PURPOSE OF VISIT TO THE LIBRARY

To identify the purpose of visit to the Library, respondents were provided with various options and the analysis of the response has been given in the following table.

TABLE 4BB.6: Purpose of Visit to the Respondents to Their Institutional Library

PURPOSE	CSL(DU)	JNU	TOTAL
To Borrow and return documents	23(29.11)	15(48.39)	38(34.55)
Light Reading	17(21.52)	7(22.58)	24(21.82)
To update knowledge	22(27.85)	3(9.68)	25(22.73)
To consult documents for research	12(15.19)	6(19.35)	18(16.36)
To consult documents for teaching	5(6.33)	Nil	5(4.54)

The data in the above table reveals that in CSL (DU) respondents visit the library mostly to borrow and return the documents and to update their knowledge. The percentage of these scientists is 29.11 %each followed by scientists visiting for light reading, to consult documents for research, and to consult documents for teaching i.e. 21.52%, 27.85% and 15.19% and 6.33% respectively. 48.39%respondents in JNU respectively visit the library to borrow and return documents. In JNU 22.58% respondents visit for light reading and for consulting documents for research each, and 9.68% to update knowledge. The maximum percentage of respondents i.e.34.55%, visit the library to borrow and return documents, 22.73% to update information, 21.82% for light reading, 16.36% to consult documents for research, and 4.54% to consult documents for teaching.

BB4.3 FREQUENCY OF VISIT TO THE LIBRARY

The frequency of visits to the library by the scientists bears relationship with the extent of use. Five point scale has used i.e. daily, twice a week, once a week, occasionally and never to find out the frequency of visit of

scientists to the institutional library. The data obtained has been presented in the following table.

TABLE 4BB.7: Frequency Of Visit by the Respondents to Their Institutional Library

FREQUENCY OF VISIT	CSL(DU)	JNU	TOTAL
Daily	28(35.44)	11(35.48)	39(35.45)
Twice a week	23(29.11)	8(25.80)	31(28.20)
Once a week	16(20.25)	7(22.58)	23(20.90)
Occasionally	12(15.20)	5(16.14)	17(15.45)
Never	Nil	Nil	Nil

The percentage of respondents visiting daily to their institutional libraries is highest in JNU i.e. 35.48% and 35.44% in CSL (DU). Scientists visiting twice a week in CSL (DU) i.e. 29.11% and 25.80% in JNU. Scientists visiting once a week to their institutional library is highest in JNU i.e. 22.58% and 20.25% in CSL (DU). Among occasional visitors 16.14% in JNU and 15.20% in CSL (DU). No scientists in chemistry in the libraries under study have been indicated that they never visit the library.

Thus 35.45% scientists visit their institutional library daily followed by 28.20% scientists visiting the library twice a week, 20.90% once a week, and 15.45% occasionally. There is, however, no scientist who does not visit the library.

Scientists visiting 'occasionally' and 'never' have been considered as irregular visitors to the library. With a view to find out the reasons why some of the scientists do not visit library regularly, five possible reasons have been provided to be ticked by irregular visitors. The following table

gives the response provided by the scientists against the options indicated in the table 4BB.8.

Among Irregular visitors, 40% respondents in CSL (DU) feel that working hours of library are not convenient, whereas, 30% respondents are irregular visitors because the library is far away from place of residence, and another 30% feel that document collection does not meet their information need.

TABLE 4BB.8: Reasons for Irregular Visits by Respondents to Their Institutional Library

REASONS FOR IRREGULAR VISITS	CSL(DU)	JNU	TOTAL
Far away from place of work	Nil	Nil	Nil
Far away from place of residence	3(30.00)	Nil	3(27.28)
Working hours not convenient	4(40.00)	Nil	4(36.36)
Collection does not meet information needs	3(30.00)	1(100.00)	4(36.36)
Environment not congenial	Nil	Nil	Nil

The library is far from place of work, another 50% feel that its collection does not meet information needs. In JNU 100% respondents have indicated that their institutional collection does not meet information needs.

Thus we find that 36.36% irregular visitors have indicated the library is far of from place of residence, and working hours are not convenient, as the reasons for their irregular visits, whereas for another 36.36% and 27.28% scientists library collection does not meet their information needs and the library is far away from place of work as the reason.

BB4.4 TIME SPENT ON READING

A question has been asked to find out the time spent on reading inside the library as it bears correlation with use of periodicals by scientists. The response of time spent on reading per week has been presented in the following table in four categories i.e. less than 10 hours, 11 to 20 hours, 21 to 30 hours, above 30 hours.

TABLE 4BB.9: Time Spent of Reading and Study By Respondents In Their Institutional Library

Hours per week	CSL(DU)	JNU	TOTAL
Less than 10 hours	51(64.55)	25(80.64)	76(69.09)
11 to 20 hours	19(24.05)	6(19.36)	25(22.73)
21 to 30 hours	5(6.34)	Nil	5(4.54)
above 30 hours	4(5.06)	Nil	4(3.64)

Scientists in CSL (DU) and JNU 64.55% and 80.64% respectively spend less than ten hours on reading inside the library. The percentage of respondents spending 11 to 20 hours on reading inside the library is higher in CSL (DU) and lower in (19.36%) JNU. Respondents spending 21 to 30 hours inside the library on reading is higher in CSL (DU) 6.34% whereas nil by JNU respondents.

Overall, 69.09% respondents in the field of chemistry spend less than 10 hours on reading inside the library followed by 22.73%, 4.54% and 3.64% respondents who spend 11 to 20 hours, 21 to 30 hours and more than 30 hours on reading inside the library.

BB5 USEFULNESS OF DIFFERENT TYPES OF DOCUMENTS

Scientists use different categories of documents for their study and research. To identify which category of documents is most used by them, a question indicating 10 categories of documents measured on 3 point scale i.e. Most useful, Useful, and Less Useful has been asked. The response has been tabulated and present in the following table.

TABLE 4BB.10: Respondent's Perception on Usefulness of Different Types of Documents

TYPE OF DOCUMENT	CSL(DU)			JNU		
	MU	U	LU	MU	U	LU
Books/monographs	15(18.99)	55(69.62)	9(11.39)	9(29.03)	19(61.29)	3(9.68)
Handbooks/data compilations	8(10.13)	38(48.10)	33(41.77)	4(12.90)	18(58.06)	9(29.04)
Indexes/abstracts	58(73.42)	16(20.25)	5(6.33)	7(22.58)	22(70.97)	2(6.45)
Periodicals	64(73.42)	9(11.39)	6(7.59)	31(100.00)	Nil	Nil
Patents/standards/specifications	6(7.59)	25(31.65)	48(60.76)	2(6.45)	12(38.70)	17(54.84)
conference proceedings	11(13.92)	38(48.10)	30(37.98)	3(9.68)	13(41.93)	15(48.39)
research reports	39(49.37)	32(40.50)	8(10.13)	22(70.97)	7(22.58)	2(6.45)
dissertations/theses	17(21.52)	43(54.43)	19(24.05)	2(6.45)	16(51.61)	13(41.94)
trade literature	4(5.06)	11(13.92)	64(81.02)	1(3.23)	6(19.35)	24(77.42)
review literature	47(59.49)	24(30.38)	8(10.13)	25(80.65)	4(12.90)	2(6.45)

MU – Most Useful;

U – Useful;

LU – Less Useful

The periodicals have been judged as 'Most Useful' by 73.42% respondents in CSL (DU) followed by Indexes and Abstracts i.e. 73.42%, Review Literature 59.49%, Research Reports 49.37; and books/Monographs, Handbooks and Data Compilations, Dissertations and these all account for 18.99% each, Conference Proceedings 13.12%, Patents/standards/Specifications 7.59%. The next category according to extent of usefulness is 'useful' and the highest score in this category is of books (69.62%) followed by dissertations and Theses (54.43%), Handbooks and data compilations (48.10%), Conference Proceedings (48.10%) etc. The Trade Literature and Patents/Standards/Specifications have been identified as 'Less Useful' to the extent of 81.02% and 60.76% respectively.

In JNU 'Periodicals score 100% in different categories of documents as 'most useful' followed by Review Literature i.e. 80.65%, Research Reports i.e. 70.97%, Indexes and Abstracts i.e. 22.58%. Books are found 'useful' by 61.29% scientists followed by Indexes and Abstracts i.e. 70.97%; Handbooks and Data Compilations and Dissertations and Theses both 58.06% each, Conference Proceedings 41.93%. The categories of document which have been found as 'less useful' by most of the respondents are Trade Literature and Patents/Standards/Specifications i.e. 77.42% and 54.84% respectively. The periodicals occupy the highest place as most useful in both selected University Libraries in Delhi.

BB6 USE OF PERIODICALS

BB6.1 PURPOSE OF USING PERIODICALS

Scientists use periodicals with different purposes in view. They use it for keeping themselves updated or for research or for teaching etc. A multiple choices have been indicated in the questionnaire and the responses received from the scientists have been presented in the Table 4BB.11.

TABLE 4BB.11: Purpose of using current and Back Files of Periodicals by Scientists.

Purpose	CSL(DU)	JNU	Total
<u>Current Periodicals</u>			
Browsing and updating information	28(35.44)	7(22.58)	35(21.82)
Research work	35(44.30)	15(48.39)	50(45.45)
Class room teaching	6(7.59)	6(19.35)	12(10.90)
Information search	10(12.67)	3(9.68)	13(11.83)
<u>Back files of Periodicals</u>			
Research work	58(73.42)	21(67.74)	79(71.82)
Class room teaching	6(7.59)	7(22.58)	13(11.82)
Information search	15(18.99)	3(9.68)	18(16.36)

Research work has been indicated as the purpose for the use of current periodical, for 44.30% respondents in CSL (DU) followed by browsing and classroom teaching for 7.59% respondents. In JNU 48.39% respondents use current periodicals for their research work. Search for 22.58%, whereas in JNU it is followed by keeping update i.e. 22.58%, classroom teaching i.e. 16.67%, and information search i.e. 9.68%.

73.42% respondents in CSL (DU) 67.74% in JNU have indicated research work as the purpose of using back volumes of periodicals. In CSL (DU) it has been followed by information search with 18.99% and Respondents and class room teaching 7.59% respectively. In JNU class 22.58%

respondents and information search as purpose have indicated room teaching as purpose of use of back volumes of periodicals by 9.68%

Thus, the overall analysis reveals that 45.45% respondents use current periodicals for research work followed by browsing and keeping updated, with latest information, information search, and classroom teaching by 31.82%, 10.90% and 11.83% respondents respectively. Back volumes of periodicals are used for research work by 71.82% respondents followed by for information search and class room teaching by 16.36% and 11.82% respondents.

BB6.2 SOURCES INITIATING RESPONDENTS FOR THE ACCESS AND USE OF A PERIODICAL

Scientists are initiated by different sources to use the periodicals for information. A question on the source with initiated the scientists for an access to the periodical has been asked by giving different choices like direct browsing, Indexing and Abstracting periodicals, Citations in the articles, discussion with colleagues, attending conference and Seminars and invisible colleges etc. The analysis has been presented in the following Table.

TABLE 4BB.12: Sources Initiating the Scientists for Access to a periodicals

Source	CSL(DU)	JNU	Total
Direct Browsing	12(15.19)	6(19.35)	18(16.36)
Indexing/ Abstracting	26(32.91)	13(41.93)	39(35.45)
Citations	18(22.78)	7(22.58)	25(22.73)
Discussions with colleagues	13(16.46)	3(9.68)	16(14.55)
Attending Conference	7(8.86)	2(6.45)	9(8.18)
Invisible college	3(3.80)	Nil	3(2.73)

In CSL (DU) Indexing and Abstracting Sources have been indicated as an initiating factor to use a particular periodical by 32.91% respondents followed by citations for 22.78%, direct browsing, and discussion with colleagues for 16.46% each, attending conferences and seminars for 8.86%, and invisible colleges for 3.80% respondents. In JNU Indexing and Abstracting sources are initiating factor for use of periodicals for 41.93% respondents followed by citations for 22.58%, direct browsing for 19.35%, and discussion with colleagues and attending conferences and seminar for 9.68%, 6.45% respondents in each.

The analysis reveals that Indexing and Abstracting sources are the initiating factor for use of periodicals for 35.45% respondents in Chemistry followed by Citations i.e. 22.73%, direct browsing i.e. 16.35%, discussion with colleagues i.e. 14.55%, attending conferences and seminars for 8.18% respondents.

BB6.3 PERIODICALS COLLECTION

Use of periodicals is effected by their availability in the library. To know about the adequacy of periodicals collection in selected both university libraries. The questions on the adequacy of periodical collection and on the alternative methods used in case of non-availability of periodicals have been

asked by giving multiple choice. Adequacy of collection as revealed by scientists of selected libraries has been presented in the following table.

TABLE 4BA.13: Opinion of Respondents on Adequacy of Periodicals' Collection

Adequacy of periodicals collection	CSL(DU)	JNU	Total
Yes	38(48.10)	15(48.39)	53(48.18)
No	41(51.90)	16(51.61)	57(51.82)

In both university libraries more than 50% scientists have indicated that the periodicals collection of their library is not adequate enough to meet their information needs. The percentage of these scientists are 51.90% in CSL (DU) and 51.61% in JNU. In CSL (DU) 48.10% and JNU 48.39% scientists find that the periodicals collection is adequate enough to meet their information needs.

Taking both university libraries together 48.18% respondents find that the periodical collection of their library is adequate enough to meet information needs and 67.54% respondent's feels that it is not.

The scientists who do not find the collection of their library adequate have been asked to indicate alternative methods use by them. For this five alternative methods have been listed. The responses have been analysed and presented in the following table.

**TABLE 4BA.14: Alternative Methods Used by respondents for
Using Periodicals**

Alternative Methods	CSL(DU)	JNU	Total
Consulting Periodicals in other Libraries	29(70.73)	9(56.25)	38(66.67)
Borrowing Personally from other Libraries	3(7.32)	3(18.75)	6(10.53)
Inter Library Loan	2(4.88)	2(12.50)	4(7.02)
Requesting Author to Send Reprint	5(12.19)	2(12.50)	7(12.28)
Abandon the Search	2(4.88)	Nil	2(3.50)
Total	41(100)	16(100)	57(100)

Most of the respondents in all the institutions consult periodicals in other libraries as an alternate method to meet their information needs. The percentage being 70.73% in CSL (DU) and 56.25% in JNU. In CSL (DU) other methods used are to request author to send reprint by 12.19% respondents, borrowing personally from other libraries by 7.32%, and inter library loan and abandon the search by 4.88% respondents each. In JNU borrowing periodicals personally from other libraries has been indicated as an alternate methods by 18.75% respondents followed by getting periodicals on inter library loan, and requesting the author to sent reprint by 12.50% respondents each.

Thus 38 i.e. 66.67% scientists like to consult the periodicals in other libraries as an alternate method and 10.53% scientists each borrow it personally on loan or request the library to borrow it on inter library loan; and 12.28% scientists prefer to request the author to sent the reprint, and only 3.50% scientists abandon the search.

To know the attitude of library towards the request of its users for subscription to periodical not held by the library a few questions have been asked from the scientist and a possible reasons have been provided to be marked by them. The replies received from respondents have been presented in the following table. The first table gives the analysis whether the request for getting a periodical was ever made to the library. The second table gives the analysis of the action on the request made by scientists, whereas the third table gives the analysis of the reasons for not subscribing to the suggested periodicals.

TABLE 4BB.15: Number of Respondents who have requested the Library to Subscribe to New Periodicals

Requested to subscribe to Periodical	CSL(DU)	JNU	Total
Yes	39(49.37)	14(45.16)	53(48.18)
No	40(50.63)	17(54.84)	57(51.82)

The data reveals that in CSL (DU) and JNU 49.37% and 45.16% scientists respectively have requested the library to subscribe to new periodicals, whereas, 50.63% and 54.84% scientists from CSL (DU) and JNU respectively did not make any request to subscribe periodicals.

TABLE 4BB.16: Library's Action on requests for Subscription to New Periodical's

Response to Subscription to Suggested Periodicals	CSL(DU)	JNU	Total
Yes	5(12.82)	2(14.29)	7(13.21)
No	34(87.18)	12(85.71)	46(86.79)
Total	39(100)	14(100)	53(100)

The above data reveals that out of total 39 requests made by scientists to subscribe to new periodicals 12.82% in CSL (DU) and 14.29% in JNU scientist have confirmed the subscription. Which is 13.21% of the total requests i.e. 86.79% of the total requests could not be acceded by the library. With regard to the various reasons for not meeting the request to subscribe to a new periodical the analysis of the response has been presented in the following table.

TABLE 4BB.17: Reasons for not subscribing to the Requested Periodicals

Reason	CSL(DU)	JNU	Total
Lack of Funds	15(44.12)	8(66.67)	23(50.00)
Non Approval by Authorities	8(23.53)	Nil	8(17.39)
Working/ Sharing Arrangement	4(11.76)	Nil	4(8.70)
Done	3(8.83)	Nil	3(6.52)
Request not Looked in to	2(5.88)	Nil	2(4.35)
Others	2(5.88)	4(33.33)	6(13.04)
Total	34(100)	12(100)	46(100)

In CSL (DU) 44.12% scientists and in JNU 66.67% scientists have indicated lack of funds as the primary reason for not subscribing to newly suggested periodicals, whereas, for 23.53% CSL (DU) respondents new subscriptions were not approved by authorities. According to other 11.76% CSL (DU) respondents working/ sharing arrangement has been done.

Thus the analysis reveals that 50% respondents of both University libraries have indicated that lack of funds as the main reason for not subscribing to the requested periodical, whereas, for 23.53%, 11.76% respondents the authorities did not approve the subscription and sharing arrangement has been done with other libraries. In addition 5.88% scientists feel that their request was not looked into and 5.88% respondents did not express any reason.

BB6.4 USE Vs. FORMS OF PERIODICALS

The periodicals collection consists periodicals in printed form as well as in non conventional forms like E-Journals, CD-ROM, and so on. With a view to know scientists' preference to use the various forms of periodicals (Printed and non-conventional) questions have been asked in the questionnaire. The responses have been analysed and presented in the following table.

**TABLE 4BB.18: Extent o Use of Periodicals by Respondents in
Non-Conventional forms (other than Printed Form)**

Use of Periodicals in other than Printed Form	CSL(DU)	JNU	Total
Yes	69(87.34)	30(96.77)	99(90.00)
No	10(12.66)	1(3.23)	11(10.00)

The analysis reveals that 87.34%, 96.77% scientists from both university libraries indicated that they used periodicals in on conventional form. And among E- Journals, CD-ROM is the preferred category.

BB6.5 USE Vs LANGUAGE

Periodicals are published in many languages. To know the preference of scientists with regard to the language, two questions, one on the weightage to language and other on language preferred (English or other than English) for use of periodicals have been asked. The response reveals that almost all respondents of selected both university libraries give weightage to language while using periodicals and prefer to use periodicals in English language only.

BB6.6 USE Vs COUNTRY OF ORIGIN

To identify the weightage given to the country of origin for using periodicals by the scientist's two questions have been asked in the questionnaire. Responses have been analysed and presented in the following table.

TABLE 4BB.19: Weightage given to the Country of Origin of a Periodical by respondents in Use of a Periodical

Weightage to Country of origin	CSL(DU)	JNU	Total
Yes	58(73.42)	23(74.19)	81(73.64)
No	21(26.58)	8(25.81)	29(26.36)
Total	79(100)	31(100)	110(100)

As revealed from the data in CSL (DU) and JNU more than 50% scientists i.e. 73.42% and 74.19% respectively give weightage to the country of origin of periodicals while using periodicals. Thus in all 26.36% scientists do not give weightage to the country of origin.

Scientists who give weightage have further been asked a question and two options have been provided. These are in respect of Indian and Foreign, which have to be indicated as their preference. The data obtained has been analysed and presented in the following table.

TABLE 4BB.20: Respondents' Preference for Use of Indian/ Foreign Periodicals

Country of Origin	CSL(DU)	JNU	TOTAL
Indian	23(39.66)	5(21.74)	28(34.57)
Foreign	35(60.34)	18(78.26)	53(65.43)
Total	58(100)	23(100)	81(100)

In CSL (DU) out of 58 respondents, 23 i.e. 39.66% have given their preference to use periodicals originating from Indian, whereas, in JNU 21.74% respondents in each have preferred so. Thus, overall 53 i.e. 65.43% respondents prefer to use periodicals of foreign origin and only 28 i.e. 34.57% respondents prefer periodicals originating from India.

BB6.7 USE Vs TYPE OF PUBLISHER

Periodicals are brought out by different types of publishers viz. learned societies, Academic and Research institutions, Government, and Commercial publisher, etc. and it is likely that use of periodicals may have a relationship with the type of publisher. In order to know, if any, weightage is given by the scientists to the publisher while using periodicals, questions have

been asked on this aspect and responses received have been analysed and presented in the followed table.

TABLE 4BB.21: Weightage Given by Respondents to publisher in Periodicals' use

Weightage to Publisher	CSL(DU)	JNU	Total
Yes	28(35.44)	15(48.39)	43(39.09)
No	51(64.56)	16(51.61)	67(60.91)

In CSL (DU) 35.44% respondents and in JNU 48.39% each have responded positively and stated that they give the weightage to the publisher, whereas, 60.91% respondents in both university libraries have said no weightage is given.

As mentioned they have provided earlier respondents giving positive reply with multiple choices so as to indicate the preferred publisher. Responses have been analysed in the following table.

TABLE 4BB.22: Type of Publishers Preferred by Respondents in Use of Periodicals

Type of Publisher	CSL(DU)	JNU	Total
Learned Society	6(21.43)	5(33.33)	11(25.58)
Academic/ Research Institute	20(71.43)	9(60.00)	29(67.44)
Government	2(7.14)	1(6.67)	3(6.98)
Commercial	Nil	Nil	Nil
Total	28(100)	15(100)	43(100)

In CSL (DU) 71.43% and in JNU 60% respondents prefer periodicals published by academic/research institutions as compared with 21.43% and 33.33% respondents 25.58% respondents from JNU prefer periodicals published by Government. Who proper periodicals published by learned societies CSL (DU) 7.14% and 6.67% respondents from JNU.

Thus we find that 67.44% scientists prefer to use periodicals published by academic and research institutes followed by periodicals published by learned societies and Government with 25.58% and 6.98% respectively.

BB7 LIBRARY SERVICES

BB7.1 AWARENESS OF LIBRARY SERVICES

Use of Periodicals is dependent on the services provided by the library. How far the scientists are aware of these services and make use of these is, therefore, an important aspect in use of periodicals. A question on awareness of library services by listing 9 important services has been asked and the response has been presented in the following Table.

TABLE 4BB.23: Respondents' Awareness of Different Library Services provided by the Institution

Type of Service	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
Lending	70(88.61)	9(11.39)	29(93.55)	02(6.45)	99(90.00)	11(10.00)
Inter Library Loan	31(39.24)	48(60.76)	9(29.03)	22(70.97)	40(36.36)	70(63.64)
Reference	55(69.62)	24(30.38)	21(67.74)	10(32.26)	76(69.09)	34(30.91)
Bibliographical	36(45.57)	43(54.43)	20(64.52)	11(35.48)	56(50.90)	54(49.10)
CAS	34(43.04)	45(56.96)	23(74.19)	8(25.81)	57(51.82)	53(48.18)
SDI	6(7.59)	73(92.41)	6(19.35)	25(80.65)	12(10.91)	98(89.09)
Indexing/ Abstracting	45(56.96)	34(43.04)	19(61.29)	12(38.71)	64(58.18)	46(41.82)
Photocopying	70(88.61)	9(11.39)	31(100.00)	Nil	101(91.82)	9(8.18)
Translation	Nil	79(100.00)	NIL	31(100.00)	Nil	110(100)

While analyzing the data it has been found that in CSL (DU) 88.61% and 88.61% respondents are aware of lending services and photocopying services provided by the library respectively, 39.24% and 56.96% respondents are aware of: Inter-Library Loan and Indexing Abstracting Services respectively, 43.04% each are aware of bibliographical and CAS services. The percentage of respondents aware of ILL services is comparatively low and is only 36.36%, whereas no respondent is aware of translation services provided library. In JNU all the respondents i.e. 93.55% are aware of lending services as well as Photocopying services, and 67.74% respondents are aware of references and by bibliographical services in each and 64.52% are aware of CAS and indexing/Abstracting services, whereas, 29.03% are aware of ILL and 19.35% are aware of SDI service .No scientist is aware of translation services provided by the libraries

The analysis thus, reveals that most of the scientists are aware about lending, photocopying and references service provided by the libraries; and very few are aware about translation facilities and SDI services. Response on awareness of reference, bibliographical and CAS services ranges in between the two.

BA7 .2 LENDING SERVICE

Question on provision of lending periodicals (current and back issues) has been asked. The data has been presented in following Two Tables.

TABLE 4BB.24: Provision of Lending Services for current and Back Files of periodicals to Respondents

Lending of Periodicals	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
Current Issues	3(3.80)	76(96.20)	2(6.45)	29(93.55)	5(4.55)	105(95.45)
Back files	7(8.82)	72(91.14)	6(19.35)	25(80.65)	13(11.82)	97(88.18)

In CSL (DU) only 3.80% and 8.86% respondents have confirmed the provision of lending out current and back files of periodicals whereas In JNU only 6.45% have replied positively for provision of Loaning out current periodicals. The percentage for lending back files of periodicals is comparatively high i.e. 19.35% in JNU.

Thus we find that 4.55% respondents in all have confirmed the provision of lending and current issues of periodicals and 95.45% have denied, whereas, for back volumes 11.82% respectively have confirmed the provision of lending periodicals.

Having analysed data on provision for lending of current as well as back files of periodicals respondents were requested to indicate whether current and back files of periodicals should be loaned out or not. The data has been analysed in the following table.

TABLE 4BB.25: Respondents' opinion on whether current and Back Files of periodicals be Loaned or Not

Periodicals	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
Current Issues	19(24.05)	60(75.95)	7(22.58)	24(77.42)	26(23.64)	84(76.36)
Back Files	59(74.68)	20(25.32)	5(19.35)	6(19.35)	84(76.36)	26(23.64)

In CSL 24.05% respondents as compared with 22.58% in JNU have recommended the lending of current issues of periodicals. Lending of back files has been suggested by 74.68%, 80.65%, respondents of CSL (DU) and JNU respectively.

Thus, we find that 76.35% respondents have not suggested the lending of current issues of periodicals, and 23.64% for lending of back files of periodicals.

BB7.3 INTER-LIBRARY LOAN (ILL)

No library is self-sufficient. To meet the maximum requirements of its users. Libraries, therefore, borrow and lend documents on ILL and the same is true for periodicals. To find out the extent of the provision of ILL services, questions on the provision of the services and on time period taken to borrow the document of ILL have been asked. The responses have been presented in following Table.

TABLE 4BB.26: Provision of ILL Service for periodicals worth Different Libraries

Provision of ILL	CSL(DU)	JNU	Total
Yes	20(25.32)	10(32.26)	30(27.27)
No	59(74.68)	21(67.74)	80(72.73)

In CSL (DU) 25.32% respondents replied positively on the provision of ILL services by the library, whereas In JNU, 32.26% respondents respectively gave positive response and 67.74%, gave negative response. Thus, in all, 27.27% respondents have stated that periodicals are obtained on ILL and 72.73% have denied the provision.

With regard to time taken for obtaining periodicals on ILL, three points scale has been used. It is less than one week, one week and more than week. The replies have been analysed and presented in the following table.

TABLE 4BB.27: Time Taken to get a periodical needed by a run through ILL.

Time Taken	CSL(DU)	JNU	Total
Less than one week	2(10.00)	Nil	2(6.67)
One week	6(30.00)	2(20.00)	8(26.67)
More than one week	12(60.00)	8(80.00)	20(66.66)
Total	20(100)	10(100)	30(100)

In CSL (DU) this time is one week according to 30% scientists. In JNU all respondents have indicated this period as more than one week, the library and more than one weak according to 80% scientists.

The overall analysis reveals that only 6.67% respondents have said that library takes less than one week to acquire periodicals on ILL followed by 26.67% and 66.66% respondents who have said that time is one week and more than a week respectively.

BB7.4 REFERENCE AND INFORMATION SERVICE

Provision of different types of reference and information services to users is a common feature in both university libraries. It helps the users to use the document collection. Scientist's opinion has been sought on different aspects of reference and information services, which could be helpful in using periodicals. The table 4BB.28 presents the analysis of responses received from the respondents.

The assistance in searching the periodicals has been confirmed by 86.08% respondents in CSL (DU) and 74.19% in JNU. Help in information search has been confirmed by 56.96% respondents of CSL (DU) and 54.84% of JNU. With regard to their suggestions to provided reference services, 65.82%CSL (DU) respondents and 90.32% in JNU have given positive

response. It can, therefore, be concluded that respondents feel the necessity of reference and information service.

TABLE 4BB.28: Provision of Different Types of Reference and Information Services by Libraries

Type of Reference Service	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
To Search Periodicals	68(86.08)	11(13.92)	23(74.19)	8(25.81)	91(82.73)	19(17.27)
To search Information	45(56.96)	34(43.04)	17(54.84)	14(45.16)	62(56.36)	48(43.64)
Suggestions to Provide Reference Service	52(65.82)	27(34.18)	28(90.32)	3(9.68)	80(72.73)	30(27.27)

A question on usefulness of different services provided by the library has been asked and responses have been measured on three-point scale i.e. 'Most Useful', 'Useful', and 'Not Useful'. The data thus received has been tabulated and presented in the following table.

TABLE 4BB.29: Respondents opinion on usefulness of Information services provided to them by Their Library

Service	CSL(DU)			JNU		
	MU	U	LU	MU	U	LU
Bibliographical Services	2(2.53)	9(11.39)	5(86.08)	Nil	12(38.71)	19(61.29)
CAS	1(1.27)	22(27.85)	56(70.89)	3(9.68)	15(48.39)	13(41.93)
SDI	Nil	15(18.99)	64(81.01)	Nil	10(32.26)	21(67.74)

In CSL (DU) 86.08% respondents and 61.29% in JNU have denied the usefulness of bibliographical services provided by the libraries. CAS has been found 'not useful' by 70.88% respondents in CSL (DU) scientists and 41.93 in JNU. 81.99% respondents of CSL (DU) and JNU.

The overall analysis reveals that comparatively more scientists in CSL (DU) and JNU are satisfied with CAS services provided by the library than that of bibliographical or SDI services.

BB 7.5 INDEXING /ABSTRACTING SERVICES

Indexing & Abstracting services provided by the library could be one of the important motivating factors for the use of periodicals. The purpose, therefore, is to find out whether this service is being provided by the library, adequacy in coverage as well as on the frequency of its publication. The analysis shows a mixed opinion on I/A sources available in the library and the I/A services provided by the library.

TABLE 4BB.30: Respondents opinion on different aspects of Indexing / Abstracting Services

Service	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
Provision to I/A Service	40(50.63)	39(49.37)	16(51.61)	15(48.39)	56(50.91)	54(49.09)
<u>Satisfaction with:</u>						
Adequacy in coverage	37(46.84)	42(53.16)	10(32.26)	21(67.74)	47(42.73)	63(57.27)
Frequency of publication	39(49.37)	40(50.63)	12(38.71)	19(61.29)	51(46.36)	59(53.64)

The provision of I/A services has been confirmed by 50.63% respondents of CSL (DU) and 51.61% in JNU with regard to adequacy in coverage 46.84% respondents in CSL (DU) and 32.26% in JNU confirmed that

the scope is adequately covered. Satisfaction with the frequency of publication has been confirmed by 50.63% and 61.29% respondents of CSL (DU) and JNU respondents of respective libraries have expressed that they are not satisfied with the frequency of publication.

The overall analysis, therefore, reveals that 50.91% Scientists in both university libraries' have confirmed the provision of I/A services, whereas, 46.36%, and 42.73% in both University libraries have responded positively with regard to their satisfaction about frequency of publication and adequacy in coverage.

BB7.6 PHOTOCOPYING FACILITIES

Photocopying services provided by the library photocopying facilities arranged by the libraries for the use of its readers is the common and important factor influencing the use of the documents in a library material, time taken to get a document Photostat also affects the use of the document in a library. Therefore, a question on time taken to get a document (5 pages on an average) for Photostat has been asked from respondents. The response have been analysed and presented in the Table 4 BB. 31.

TABLE 4BB.31: Time taken in providing a Document duly Xeroxed/Photostatted by Library

Time Taken	CSL(DU)	JNU	Total
Less than an hour	40(50.63)	15(48.39)	55(50.00)
1-3 hours	13(16.46)	4(12.90)	17(15.45)
3-5 hours	9(11.39)	5(16.13)	14(12.73)
5-7 hours	5(6.03)	4(12.90)	9(8.18)
More than a day	12(15.19)	3(9.68)	15(13.64)
Total	79(100)	31(100)	110(100)

In CSL (DU) according to 50.63% respondents time taken for photocopying is less than an hour, for 16.46 % 1-3 hours, for 11.39% 3-5 hours, for 6.33% 5 to 7 hours, and for 15.19% its library takes more than a day for photocopying is less than a day for photocopy work.

48.39 % respondents in JNU have stated thing crime to be less than an hour, where as 12.90%, 16.13% and 12.90% and 9.68% scientist to have stated it as 1-3 hours, 3-5 hours, 5-7 hours and more than a day.

Thus the overall analysis reveals that for 50% respondents library takes less than an hour followed by 1-3 hours, 3-5' hours, 5-7 hours and more than a day, as stated by 15.45%, 12.73%, 8.18% and 13.64% respectively.

TABLE 4BB.32: Use of Photocopy services by respondents from other than their libraries

Respondents	CSL(DU)	JNU	Total
Yes	70(88.61)	28(90.32)	98(89.09)
No	9(11.39)	3(9.68)	12(10.91)

In all 89.09% scientists of both university libraries under study are using photocopying services provided for agencies other than their library also. Library wise this percentage is 88.61% and 90.32% respectively.

BB7.6 AVAILABILITY OF TRANSLATION SERVICE

The provision of translation facilities helps the scientists to use literature published in different languages. The scientists have denied availability of translation services.

BB 8 USER'S OVERALL RATING

The opinion of scientists on the rating of reading' and study environment of the selected both university libraries has also sought by using 3 point scale i.e. most congenial, 'congenial' and 'not congenial'.

TABLE 4BB.33: Respondents Opinion on Reading and Study Environment in their Library

	CSL(DU)			JNU		
	MC	C	NC	MC	C	NC
Study and Reading Environment in the library	15(18.99)	60(75.95)	4(5.06)	10(32.26)	21(67.74)	Nil

MC - Most Congenial, C - Congenial, NC - Not Congenial

More than 50% respondents in libraries have indicated that the reading and study environment of Library is 'congenial'. Only 5.06% respondents in CSL (DU).

Find it 'not congenial' compared with 18.99%, and 32.26% in CSL (DU) and JNU respectively who and reading environment is 'most congenial'.

Scientists overall opinion on the library services, periodicals collection, library staff, etc. which helps to enhance the use of periodicals has also been sought. The analysis of the same has been presented in following few paras.

TABLE 4BB.34: Respondents Opinion on library services and attitude of library staff

	CSL(DU)			JNU		
	MH	H	NH	MH	H	NH
Display of Current Periodicals	9(11.39)	65(82.28)	5(6.33)	12(38.71)	17(54.84)	02(6.45)
Arrangement of Back files of Periodicals	29(36.71)	40(50.63)	10(12.66)	5(16.13)	25(80.65)	1(3.22)
Attitude of Library Staff	17(21.52)	50(63.29)	12(15.19)	8(25.81)	13(41.94)	10(32.25)

MH - Most Helpful, H - Helpful, NH - Not Helpful

Display of periodicals on the shelf is found to be 'helpful' by of 82.28% and 54.84% respondents in CSL (DU) and JNU respectively, whereas, 11.39% respondents in CSL (DU), 38.71% in JNU, each find it most useful. The percentage of respondents finding the display periodicals as not helpful is quite insignificant.

Arrangement of back volumes of periodicals has also been found helpful' by most of the respondents i.e. 50.63% in CSL (DU) and 80.65% in JNU find the arrangement of back volume as 'helpful' whereas 36.71% find it most helpful and 12.66% not helpful. In both libraries comparatively less number of

respondents find the arrangement of back volumes of periodicals as a most helpful' i.e. 36.71% in CSL (DU) 16.13% in JNU.

Attitude of Library staff towards the scientists and their information needs has been found 'most helpful' by 21.52% and 25.81% respondents in CSL (DU) and JNU respectively, whereas, 63.29% in CSL (DU) and 41.94 in JNU find it 'helpful', and comparatively lower percentage of respondents find it 'not helpful'.

The opinion of scientists has also been sought on the competence of library staff to give service to users on three-point scale.

TABLE 4BB.35: Respondents Opinion on Competence of library staff in meeting their information needs

Competence of library Staff	CSL(DU)			JNU		
	MC	C	NC	MC	C	NC
	30(37.97)	42(53.16)	7(8.87)	8(25.81)	20(64.52)	3(9.67)

MC - Most Competence, C -, Competence, NC - Not Competence

In CSL (DU) 37.97% scientists' find that the library staff is most competent to give service in comparison with 25.81% in JNU. For 53.16% and 64.52% respondents of CSL (DU) and JNU staff is competent and only 8.87% respondents in CSL (DU) and 9.67% in JNU that find the staff is not competent to give service.

Opinion on usefulness of periodicals collection in their respective libraries has also been ascertained from the scientists and the same has been

measured on 3 point scale. The analysis has been presented in the following Table.

TABLE 4BB.36: Respondents Opinion on about usefulness of periodical collection

Usefulness of Periodicals Collection of Library	CSL(DU)			JNU		
	MU	U	NU	MU	U	NU
	24 (30.38)	45 (56.96)	10 (12.66)	3 (9.68)	27 (87.10)	1 (3.22)

MU - Most Useful, U - Useful, NU - Not Useful

As revealed from the above Table only 30.38% respondents from CSL (DU) and 9.68% from JNU each find their periodical collection 'most useful' whereas the percentage of respondents who find their collection 'useful' ranges in between 56.96% and 87.10%, whereas 12.66% of CSL (DU), and 3.22% scientists of JNU find it so.

BC MATHS

BC 1 INTRODUCTION

Math's is a subject of teaching or research or both in CSL (DU) and JNU, in all 58 scientists are working in the field of Math's in both University Libraries and 34 i.e. 58.62% questionnaires have been administered to them, out of these 24 i.e. 70.59% have responded. The library wise brake up of questionnaires administered and their response has been given in the following table.

**TABLE 4BC.1: Sample Size and Response Rate of Scientists in
Math's**

Library	Population	Questionnaire		Percentage Of Sample Analysed Of The Population
		Administrat ed	Responded	
CSL(DU)	35	29 (82.86)	15 (51.72)	42.86
JNU	23	15 (65.22)	9 (60.00)	39.13
TOTAL	58	44 (75.86)	24 (54.55)	41.38

In CSL (DU) there are 35 scientists and 19 i.e. 54.29% questionnaires have been administered and 15 i.e. 82.86% questionnaires, duly filled in have been received. and in JNU there are for 23 scientists and 15 questionnaires i.e. 65.22% were administered and 9 questionnaires i.e. 60 % have been received respectively.

Thus the sizes of the sample to which the questionnaires have been administered and the responses received vary between 51.72%, 42.86% and 75.86% and 60%.

BC 2 CATEGORIES OF RESPONDENTS AND THEIR ACTIVITIES

BC2.1 CATEGORY WISE RESPONSE

With a view to find out category of scientists using periodicals scientists have been asked to indicate their status. The data on status has been sought broadly for categories i.e. faculty and research scholars. The table has been collected, analysed and presented in the following table.

TABLE 4BC.2: Status of Respondents in Different Libraries under Study

STATUS	CSL(DU)				JNU			
	1	2	3	4	1	2	3	4
Faculty	9	6	4	44.44	8	5	3	37.50
		(66.67)	(66.67)			(62.50)	(60.00)	
Research scholar	26	18	15	57.69	15	10	7	46.67
		(69.23)	(83.33)			(66.67)	(70.00)	
Scientists	Nil							
Total	35	24	19	54.29	23	15	10	43.48
		(68.57)	(79.17)			(65.22)	(66.67)	

1. Population; 2. Questionnaires Administered; 3. Questionnaires Received; 4. Sample Analysed.

The analysis of data reveals that for faculty, research scholars and scientist questionnaires administered ranges between 66.67% and 69.23 %, 66.67% and 83.33% respectively, and the response between 66.67% and 43.48% for faculty, 83.33% and 70% for research scholars. Thus the sample analysed varies between 44.44% and 37.5% for faculty, 57.69% and 46.67% for research scholars.

BC2.2 ACTIVITY WISE RESPONSE

Various activities undertaken by the scientists have been analysed on the basis of the responses to the questionnaire and the same has been presented in the following Table.

TABLE 4BC.3: Type of Activities of Respondents in Both University Libraries

Types Of Activity	CSL(DU)	JNU	TOTAL
Teaching	5(25.32)	3(30.00)	8(27.59)
Research	14(73.68)	7(70.00)	21(72.41)
R&D	Nil	Nil	Nil
Management and Administration	Nil	Nil	Nil
Others	Nil	Nil	Nil
Total	19(100)	10(100)	29(100)

The table reveals that 26.32% respondents are engaged in teaching in CSL (DU), 73.68 and no respondents in research and R&D activities respectively; as compared with teaching and research in JNU is 30% and 70% respectively.

Thus, in both University libraries taken together reveals that the field of activity for 72.41% respondents is research and no respondents in R&D activities followed by 27.59% teaching. Respondents are engaged in other activities like editing etc.

BC3 RESEARCH OUTPUT OF SCIENCE

The data in the following Table reveals different types of publications brought by the scientists.

TABLE 4BC.4: Type of Publications Brought out by Respondents in Both University Libraries During 2000/01 – 2004/05

Types Of Publication	CSL(DU)	JNU
Books/ Monographs	14(2.95)	8(8.99)
Articles/Research papers in periodicals	205(43.25)	75(84.27)

Research Reports	211(44.51)	3(3.37)
Book Reviews	25(5.27)	2(2.25)
Others	19(4.02)	1(1.12)
Total	474(100.00)	89(100.00)

The data from the questionnaire as well as interview during last five years i.e. from 205 to (43.25%) articles / research papers have been in periodicals by the scientists of CSL (DU) by 211 (44.51%) research reports 25(5.27%), book reviews 19 (4.02%) other types of material like newspaper etc., and 14 (2.95%) books. In JNU, articles / research papers occupy major part the publications brought out by scientists i.e. 84.27% and 8.99% book reviews, books/monographs with 2.25% and 3.37% are research reports.

BC4 USE OF LIBRARY

BC4.1 PREFERENCE FOR USE OF A PARTICULAR LIBRARY

To know the preferences of the scientists in the use of the library, a question giving three choices has been asked and the response has been analysed and presented in the following table

TABLE 4BC.5: Preference of Use of Particular Library by Respondents to meet their Information Needs

LIBRARY	CSL(DU)	JNU	TOTAL
Own Institution	13(68.42)	6(60.00)	19(65.52)
Personal	4(21.05)	3(30.00)	7(24.14)
Other Libraries	2(10.53)	1(10.00)	3(10.34)

68.42% in CSL (DU) and in JNU that only 60% scientists prefer to use institutional library and the 10% percentage also prefers use of other libraries. In CSL (DU) the preference to use institutional library is followed by use of other libraries i.e. 10.53% respondents and personal library i.e. 21.05%.

Thus 65.52% respondents in both selected university libraries prefer to use one's own institutional library, followed by use of 'personal library', and 'other libraries' .The percentage being 24.14%and 10.34% respectively.

BC4.2 PURPOSE OF VISIT TO THE LIBRARY

The data on purpose of visit to the library has been analysed and presented in the following Table

TABLE 4BC.6: Purpose of Visit to the Respondents to Their Institutional Library

PURPOSE	CSL(DU)	JNU	TOTAL
To Borrow and return documents	2(10.53)	1(10.00)	3(10.34)
Light Reading	2(10.53)	1(10.00)	3(10.34)
To update knowledge	3(15.79)	2(20.00)	5(17.24)
To consult documents for research	10(52.63)	5(50.00)	15(51.72)
To consult documents for teaching	2(10.53)	1(10.00)	3(10.34)

In CSL (DU) and JNU, 52.63% and 50% respondents respectively visit the library to consult documents for research. In CSL (DU) it is followed by updating knowledge 15.79%, light reading 10.53%, and consultation of documents for teaching 10.53% In JNU 10.34% respondents visit the library to borrow and return the documents, followed by updating knowledge and consultation of documents for teaching with 20% and 10% each.

The analysis, therefore, reveals that 51.72% respondents visit the library to consult documents for respondents visit the library to consult documents for research purposes, followed by 17.24% who visit the library to update knowledge 10.34% to borrow and return the documents, 10.34% for light reading, and 10% for teaching purposes.

BC4. 3 FREQUENCY OF VISIT TO THE LIBRARY

The frequency of visit by the scientists to their institutional libraries has been measured on a 5 point scale and the data has been analysed and presented in the following table

TABLE 4BC.7: Frequency of Visit by the Respondents to Their Institutional Library

FREQUENCY OF VISIT	CSL(DU)	JNU	TOTAL
Daily	2(10.53)	1(10.00)	3(10.34)
Twice a week	10(52.63)	2(20.00)	12(41.38)
Once a week	4(21.05)	5(50.00)	9(31.03)
Occasionally	3(15.79)	2(20.00)	5(17.24)
Never	Nil	Nil	Nil

As revealed from the data, 52.63% respondents of CSL (DU) visit the library twice a week followed by 10.53% visiting daily 21.05% once a week and 15.79% occasionally and In JNU 50% respondents visit once a week followed by 20% who visit the library twice a week and 20% visit occasionally.

Thus, the overall analysis reveals that respondents visit the library twice a week followed by 31.04%, 10.34% and 41.38% who visit the library once a week, daily and occasionally and no scientist in the field of physics has mentioned that he never visits the library.

The scientists against the options indicated in the table have considered Scientist visiting library 'occasionally' and 'never' as irregular visitors and the following table gives the responded provide.

TABLE 4BC.8: Reasons for Irregular Visits by Respondents to Their Institutional Library

Reasons For Irregular Visits	CSL(DU)	JNU	TOTAL
Far away from place of work	Nil	Nil	Nil
Far away from place of residence	1(33.33)	1(50.00)	2(40.00)
Working hours not convenient	2(66.67)	1(50.00)	3(60.00)
Collection does not meet information needs	Nil	Nil	Nil
Environment not congenial	Nil	Nil	Nil

50% irregular visitors in JNU have indicated that the library is far away from place of residence and 50% have stated that the library does not meet their information needs and 25% have indicated that working hours does not convenient In CSL (DU) and no respondents is irregular visitors respectively have stated that the collection of library does not meet their information needs, whereas, 66.67% respondents of CSL (DU) have indicated that working hours are not convenient to them and the 33.33% respondent indicated that the library in for away from place of residents.

Thus the overall analysis reveals that collection does not meet information needs for neither respondents is irregular visitors of the library, nor reading environment is not congenial, and for 60% working hours of library are not convenient, and for the remaining 33.33% the distance from place of residence is the reason for their irregular visits.

BC4.4 TIME SPENT ON READING

The time spent by the respondent in reading has been grouped in four groups i.e. less than 10 hours, 11 to 20 hours, 21 to 30 hours, and above 30 hours. The data has been condensed tabulated and analysed in the Table 4BC.9.

In CSL (DU) spend less than ten hours on reading inside the library, followed by those spending 11 to 20 hours i.e. 44.94% and 23.60% respectively, and above 30 hours by 5.88% and 22.35%, and in JNU 21 to 30 hours by 15.79% and 5.26% scientists respectively. In JNU 42.11% scientists spend 11 to 20 hours on reading inside the library followed by those spending less than 10 hours and 21 to 30 hours with 45.19% and 15.79% scientist respectably.

TABLE 4BC.9: Time Spent of Reading and Study by Respondents in Their Institutional Library

Hours per week	CSL(DU)	JNU	TOTAL
Less than 10 hours	9(47.37)	3(30.00)	12(41.38)
11 to 20 hours	5(26.32)	4(40.00)	9(31.03)
21 to 30 hours	1(5.26)	2(20.00)	3(10.34)
above 30 hours	4(21.05)	1(10.00)	5(17.24)

Thus over all analysis reveals that 41.38% scientist sped less than 10 hours on reading inside the library followed by 31.03% scientist spending 11 to 20 hours, 10.34% spending 21 to 30 hours and 17.24% spending above 30 hours.

BC5 USEFULNESS OF DIFFERENT TYPES OF DOCUMENTS

Scientists use of different categories of documents. Has been measured on a three point scale i.e. 'most useful', 'useful' less use full and the data has been analysed in the following table.

TABLE 4BC.10: Respondent's Perception on Usefulness of Different Types of Documents

TYPE OF DOCUMENT	CSL(DU)			JNU		
	MU	U	LU	MU	U	LU
Books/monographs	3(15.79)	6(31.58)	10(52.63)	1(10.00)	2(20.00)	7(70.00)
Handbooks/data compilations	1(5.26)	6(31.58)	12(63.16)	1(10.00)	1(10.00)	8(80.00)
Indexes/abstracts	7(36.84)	9(47.37)	3(15.79)	2(20.00)	7(70.00)	1(10.00)
Periodicals	12(63.16)	5(26.32)	2(21.05)	9(90.00)	1(10.00)	Nil
Patents/standards/specifications	Nil	4(21.05)	15(78.95)	Nil	2(20.00)	8(80.00)
conference proceedings	7(36.84)	10(52.63)	2(10.53)	7(70.00)	2(20.00)	1(10.00)
research reports	5(26.32)	12(63.16)	2(10.53)	5(50.00)	4(40.00)	1(10.00)
dissertations/theses	Nil	14(73.69)	5(26.32)	1(10.00)	2(20.00)	7(70.00)
trade literature	Nil	5(26.32)	14(73.69)	Nil	2(20.00)	8(80.00)
review literature	5(26.32)	10(52.63)	4(21.05)	9(90.00)	1(10.00)	Nil

MU – Most Useful; U – Useful; LU – Less Useful

As revealed from the table books and monographs are found to be 'most useful' by 15.79% respondents in CSL (DU) and 10% in JNU. But for all 100% scientists these are 'useful' compared with 20% in JNU and 31.58% in CSL (DU).

Handbooks and date compilations have been found 'useful' by 31.58% respondents in CSL (DU) and 10% in JNU, compared with 63.16% in CSL (DU) and 80% in JNU respondents who find these 'less useful'.

In CSL (DU) 36.84% respondents and 20% in JNU find indexes and abstracts as 'most useful', 70% and 47.37% in CSL (DU) and JNU find them 'useful'.

More than 60% scientists in both University libraries find periodicals 'most useful'. This constitutes 26.32% in CSL (DU) and 10% JNU scientists. Percentage of scientists finding periodicals as 'useful' is highest in CSL (DU) compare with JNU.

Patents/standards and specifications have been indicated as 'less useful' by more than 80% in JNU and 78.95% in CSL (DU).

Conference proceedings have been indicated as 'most useful' by 70% respondents in JNU and 36.84% in CSL (DU), 52.63% in CSL (DU) and 20% in JNU find this as 'useful'.

With regard to research reports 50% JNU respondents find this 'most useful' followed by 26.32% in CSL (DU) scientists. The highest percentage of scientists who find these 'useful' is from CSL (DU) i.e. 63.16% followed by JNU (50%).

More than 70% scientists in both university libraries find dissertations and theses as 'less useful' where 100% scientists find this category as useful followed by 73.69% in CSL (DU) and 20% in JNU.

None of the scientists have indicated trade literature as 'most useful'. It has been indicated as 'less useful' by more than 80% scientists of both university libraries, whereas 20% in JNU and 26.32% CSL (DU) scientists have indicated it as 'useful'.

Review literature has been considered as 'most useful' by 90% scientists in JNU followed by 26.32% in CSL (DU). Who find it 'useful' followed by 52.63% of CSL (DU) and 10% of JNU scientists.

BC6 USE OF PERIODICALS

BC6.1 PURPOSE OF USING PERIODICALS

Multiple set of purposes have been provided to know the purpose for which current issues and back volumes of periodicals are used and scientists have been request to indicate the most appropriate answer. Analysis of the same is presented in the Table 4BC.11.

In CSL (DU), The data reveals that 42.11% respondents use current periodicals 26.32%, 21.05% and 10.52% respondents use current periodicals for browsing and updating themselves, information search, and class room teaching respectively. In JNU also most of the respondents i.e. respectively use current issues for their research work

TABLE 4BC.11: Purpose of using current and Back Files of Periodicals by Scientists.

Purpose	CSL(DU)	JNU	Total
<u>Current Periodicals</u>			
Browsing and updating information	5(26.32)	2(20.00)	7(24.14)

Research work	8(42.11)	4(40.00)	12(41.38)
Class room teaching	2(10.52)	1(10.00)	3(10.35)
Information search	4(21.05)	3(30.00)	7(24.13)
<u>Back files of Periodicals</u>			
Research work	10(52.63)	7(70.00)	17(58.62)
Class room teaching	1(5.26)	1(10.00)	2(6.90)
Information search	8(42.11)	2(20.00)	10(34.48)

Thus, The overall analysis reveals that 41.38% scientists use current periodicals for research work 24.14%, 24.13% for browsing and updating of information search and 10.35% for class room teaching in selected both university libraries.

Back files of periodicals are used for research work by 52.63% and 58.62% CSL (DU) and JNU scientists respectively, and only 42.11% of periodicals for information search is highest in CSL (DU) compare with JNU 20%.

From this analysis we find that 58.62% scientists use back files of periodicals for research work followed by 34.48% and 6.90% respondents who use these for information search and class room teaching.

**BC 6.2: SOURCES INITIATING RESPONDENTS FOR ACCESS
AND USE OF A PERIODICAL**

As in the case of chemistry a question on the above subject was asked from physicists also and the analysis of the data has been presented in the following Table.

**TABLE 4BC.12: Sources Initiating the Scientists for Access to a
periodical**

Source	CSL(DU)	JNU	Total
Direct Browsing	5(26.32)	2(20.00)	7(24.14)
Indexing/ Abstracting	3(15.79)	2(20.00)	5(17.24)
Citations	7(36.84)	4(40.00)	11(37.93)
Discussions with colleagues	3(15.79)	1(10.00)	4(13.79)
Attending Conference	1(5.26)	1(10.00)	2(6.90)
Invisible college	Nil	Nil	Nil

Direct browsing by 26.32% researchers in CSL (DU) is the source initiating the researchers to use periodical. This is followed by use of Indexes and Abstracts by 15.79% citations in the articles by 36.84%, discussions with colleagues by 15.79% and participation in invisible colleges by. Whereas, in JNU 10% researches get motivated by attending conferences and seminars, followed by direct browsing and using Indexes and Abstracts i.e.40% and 20% and citations in the articles by 40%.

Thus, the overall analysis reveals that 17.24%, scientists are initiated to the use and get access to periodicals by direct browsing i.e.37.93% citations in the articles i.e. 13.79% discussions with colleagues i.e.6.90%,

attending conferences and seminars no response, through invisible colleges in both university libraries under study.

BC6.3 PERIODICALS COLLECTION

As in chemistry user's opinion on strength of periodicals collection has been ascertained and data thus collected has been analysed in the following table.

TABLE 4BC.13: Opinion of Respondents on Adequacy of Periodicals' Collection

Adequacy of periodicals' collection	CSL(DU)	JNU	Total
Yes	8(42.11)	4(40.00)	39(37.50)
No	11(57.89)	6(60.00)	65(62.50)

The periodicals collection has been found to be adequate by 40% respondents in JNU and 42.11% in CSL (DU).

Thus 41.38% respondents from both libraries feel that collection is adequate whereas, 58.62% feel it otherwise.

Scientists who do not find needed periodicals in their institutional library adopt some alternative method to get periodicals. The responses to the question on alternative methods used by them have been analysed and presented in the following table.

TABLE 4BC.14: Alternative Methods Used by respondents for Using Periodicals

Alternative Methods	CSL(DU)	JNU	Total
Consulting Periodicals in other Libraries	5(45.46)	3(50.00)	8(47.06)
Borrowing Personally from other Libraries	1(9.09)	Nil	1(16.67)
Inter Library Loan	2(18.18)	2(33.33)	4(66.67)
Requesting Author to Send Reprint	2(18.18)	1(16.67)	3(17.65)
Abandon the Search	1(9.09)	Nil	1(5.88)
Total	11(100)	6(100)	17(100)

As an alternative to non-availability of periodical in their own library most of the scientists, i.e. 45.46% in CSL and 50 % in JNU consult periodicals in other libraries. In CSL (DU) 16.67% scientists request the author to send reprint of articles followed by 18.18% who try to get periodicals on ILL, 9.09% abandon the search, and 9.09% borrow periodicals from other.

In JNU 33.33% respondents request library to get the periodical on ILL and 16.67% requests author to send the reprint.

Thus it has been found that 47.06% respondents in both university libraries under study consult periodicals in other libraries as an alternative in case of non availability of periodicals in their institutional library, followed send reprint, 66.67% requesting library to get it on ILL, 16.67% scientist borrowing personally from other libraries and 5.88% abandoning the search.

To know, the attention paid by the library on the request of scientist for subscription to new periodicals and the reasons for not subscribing to these questions have also been asked and the responses have been presented in following tables.

TABLE 4BC.15: Number of Respondents who have requested the Library to Subscribe to New Periodicals

Requested to subscribe to Periodical	CSL(DU)	JNU	Total
Yes	7(36.84)	3(30.00)	10(34.48)
No	12(63.16)	7(70.00)	19(65.52)
Total	19(100)	10(100)	29(100)

Requesting library to subscribe new periodicals has been confirmed by 36.47% scientists in CSL (DU) 36.84% in JNU. Whereas 63.53% scientists of CSL (DU) and 70% JNU respondents have stated that library did not subscribe to the suggested periodicals.

TABLE 4BC.16: Library's Action on requests for Subscription to New Periodical's

Response to Subscription to Suggested Periodicals	CSL(DU)	JNU	Total
Yes	1(14.29)	1(33.33)	2(20.00)
No	6(85.71)	2(66.67)	8(80.00)
Total	7(100)	3(100)	10(100)

Thus the analysis reveals that in case of both university libraries under study only 20% scientists have confirmed the subscription to new suggested periodicals whereas, 80% have denied the subscription to newly requested periodical. The reasons for not subscribing to new periodicals have been presented and tabulated in the following table.

TABLE 4BC.17: Reasons for not subscribing to the Requested Periodicals

Reason	CSL(DU)	JNU	Total
Lack of Funds	4(66.67)	Nil	4(50.00)
Non Approval by Authorities	2(33.33)	1(50.00)	3(37.50)
Working/ Sharing Arrangement Done	Nil	Nil	Nil
Request not Looked in to	Nil	Nil	Nil
Other	Nil	1(50.00)	1(12.50)
Total	6(100)	2(100)	8(100)

Lack of funds as a reason to not subscribing to new periodical has been stated by 66.67% scientists in CSL (DU) whereas, authorities did not approve the request is the reason for 33.33% scientists in CSL (DU) and 50% scientists of JNU, lack of funds of a reason to not subscribing to the periodicals suggested by them.

BC 6.4 USE Vs FORMS OF PERIODICALS

Libraries maintain periodicals in other than printed form also. These may be in E-Journals or in CD-ROM and so on. Information with regard to their use has also been sought and the response has been analysed in the following Table

TABLE 4BC.18: Extent o Use of Periodicals by Respondents in Non-Conventional forms (other than Printed Form)

Use of Periodicals in other than Printed Form	CSL(DU)	JNU	Total
Yes	16(84.21)	10(100.00)	26(89.66)
No	3(15.79)	Nil	3(10.34)
Total	19(100)	10(100)	29(100)

Above 80% respondents in both University Libraries who use periodical other than printed form use E- Journals, Online, CD-ROM and so on. Out of 15.79% respondents in CSL (DU) are used printed form only.

BC6.5 USE Vs LANGUAGE

Preference with regard to language of periodicals used country of origin of periodicals and types of publisher have also been sought by asking different questions.

All respondents in the field of physics in both university libraries under study prefer periodicals in English language but few respondents read and use articles published in other languages.

BC6.6 USE Vs COUNTRY OF ORIGIN

Weightage to country of origin of periodicals has been analysed in the Table 4BC.19.

TABLE 4BC.19: Weightage given to the Country of Origin of a Periodical by respondents in Use of a Periodical

Weightage to Country of origin	CSL(DU)	JNU	Total
Yes	12(63.16)	8(80.00)	20(68.97)
No	7(36.84)	2(20.00)	9(31.03)
Total	19(100)	10(100)	29(100)

In CSL (DU) 63.16% Scientists give weightage to country of origin of periodicals, compared with 80% in JNU. Thus in all, 68.97% scientists give preference to country of origin of periodicals compared with 31.03% who do not give Weightage to the country of origin.

TABLE 4BC.20: Respondents' Preference for Use of Indian/ Foreign Periodicals

Country of Origin	CSL(DU)	JNU	TOTAL
Indian	2(16.67)	Nil	2(10.00)
Foreign	10(83.33)	8(100.00)	18(90.00)
Total	12(100)	8(100)	20(100)

Out of 20 scientists who give preference to the country of origin while using periodicals 10% prefer to use Indian periodicals, whereas 90% prefer to use periodicals from other countries. Response from the later category includes 83.33% scientists from CSL (DU) and 100% from JNU.

BC6.7 USE Vs TYPE OF PUBLISHER

In CSL (DU) 57.89% Scientists and 60% in JNU scientists which is 58.62% of total respondent have indicated that they give weightage to type

of publisher for use of periodicals whereas, 41.38% scientists do not give any weightage to type of publishers. Users response according to the type of publishers have been given in the following table

TABLE 4BC.21: Weightage Given by Respondents to publisher in Periodicals' use

Weightage to Publisher	CSL(DU)	JNU	Total
Yes	11(57.89)	6(60.00)	17(58.62)
No	8(42.11)	4(40.00)	12(41.38)
Total	19(100)	10(100)	29(100)

Users response according to the type of publishers have been given in the following table

TABLE 4BC.22: Type of Publishers Preferred by Respondents in Use of Periodicals

Type of Publisher	CSL(DU)	JNU	Total
Learned Society	3(27.27)	2(33.33)	5(29.41)
Academic/ Research Institute	8(72.73)	4(66.67)	12(70.59)
Government	Nil	Nil	Nil
Commercial	Nil	Nil	Nil
Total	11(100)	6(100)	17(100)

Out of total 17 scientists, who give preference to the periodical by type of publisher, 5 i.e. 29.41% give preference to learned societies, 12 i.e. 70.59% prefer to use periodicals brought out by academic and research institutions and no scientists prefer to use periodicals brought out by a Government publisher and no scientists prefer to use those of commercial publishers of both university libraries.

BC7 LIBRARY SERVICES

BC7.1 AWARENESS OF LIBRARY SERVICES

Different types of services provided by the libraries have been requested to indicate awareness of their provision in the library. The data so collected has been presented and analysed in the following Table

TABLE 4BC.23: Respondents' Awareness of Different Library Services provided by the Institution

Type of Service	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
Lending	15(78.95)	4(21.05)	8(80.00)	2(20.00)	23(79.31)	6(20.69)
InterLibrary Loan	14(73.68)	5(26.32)	6(60.00)	4(40.00)	20(68.97)	9(31.03)
Reference	17(89.47)	2(10.53)	7(70.00)	3(30.00)	24(82.76)	5(17.24)
Bibliographical	13(68.42)	6(31.58)	1(10.00)	9(90.00)	14(48.28)	15(51.72)
CAS	12(63.16)	7(36.84)	2(20.00)	8(80.00)	14(48.28)	15(51.72)
SDI	13(68.42)	6(31.58)	2(20.00)	8(80.00)	15(51.72)	14(48.28)
Indexing/ Abstracting	16(84.21)	3(15.79)	1(10.00)	9(90.00)	17(58.62)	12(41.38)
Photocopying	17(89.47)	2(10.53)	10(100.00)	Nil	27(93.10)	2(6.90)
Translation	3(15.79)	16(84.21)	Nil	10(100.00)	3(10.34)	26(89.66)

The lending service is known to 78.95% scientists in CSL (DU) and 80% in JNU, Inter library Loan Services is known 73.68% respondents in CSL (DU) and 60% in JNU. Awareness of reference service is indicated by 89.47% respondents in CSL (DU) and 70% in JNU. With regard to bibliographical services, CAS and SDI services 68.42%, 63.16 and 68.42% in CSL (DU) scientists and 10%, 20% and 20% in JNU respectively are aware of the service. The awareness of Indexing/ Abstracting services, Photocopying /

Xeroxing have been confirmed by 84.21% and 89.47% scientists respectively of CSL (DU), 15.79% and 100% scientists of JNU respectively. With regard to the translation services 15.79% respondents in CSL (DU) and 100% in JNU respondents have given negative response.

The overall analysis reveals that in Math's 79.31% scientists of the both university libraries are aware of lending service, 68.97% of ILL service, 82.76% of reference service, 48.28% of bibliographical services, 48.28% of CAS, 51.72% of SDI, 58.62% of I/A service, 93.10% of Photocopying or Xeroxing services, and only 10.34% scientists are aware of translation services.

BC7.2 LENDING SERVICES

As in the case of chemistry, provision use, etc. of each one of the services has been examined separately and the analysis based on responses has been given under each one of the services. Response on the provision of lending of current as well as back files of periodicals has been given in the following Table.

TABLE 4BC.24: Provision of Lending Services for current and Back Files of periodicals to Respondents

Lending of Periodicals	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
Current Issues	3(15.79)	16(84.21)	2(20.00)	8(80.00)	5(17.24)	24(82.76)
Back files	5(26.32)	14(73.68)	4(40.00)	6(60.00)	9(31.03)	20(68.97)

Lending of current issues of periodicals has been confirmed by 15.79% respondents in CSL (DU) and 20% in JNU whereas 82.76% scientists of both university libraries have denied its provision. Lending of back files of periodicals has been confirmed by 26.32% respondents in CSL (DU) and 40% in JNU whereas, 68.97% respondents of both university libraries have denied its provision.

The recommendations of scientists have also been sought on whether the periodicals should be loaned out and the data has been tabulated in the following Table.

TABLE 4BC.25: Respondents' opinion on whether current and Back Files of periodicals be Loaned or Not

Periodicals	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
Current Issues	4(21.05)	15(78.95)	3(30.00)	7(70.00)	7(24.14)	22(75.86)
Back Files	16(84.21)	3(15.79)	8(80.00)	2(20.00)	24(82.76)	5(17.24)

In CSL (DL) 21.05% respondents and 30% in JNU have suggested that current issues of periodicals should be loaned out, whereas, 75.86% scientists in both university libraries have responded otherwise. The loaning of back files has been suggested by 84.21% respondent in CSL (DU) and 80% in JNU whereas, 17.24% both university libraries under study have not suggested this.

BC7.3 INTER- LIBRARY LOAN (ILL)

No Library is self-sufficient and as a result they share documents through ILL. This is truer in periodicals. Data collected on Inter Library Loan services is presented in the following two Tables

TABLE 4BC.26: Provision of ILL Service for periodicals worth Different Libraries

Provision of ILL	CSL(DU)	JNU	Total
Yes	12(63.16)	6(60.00)	18(62.07)
No	7(36.84)	4(40.00)	11(37.93)

According to 63.16% respondents in CSL (DU) ILL services are available, whereas in case of JNU libraries i.e. 60%, who have stated positively. However, 37.93% scientists in both university libraries have denied provision of this service.

Scientists who have confirmed the availability of this service in their libraries have been requested to indicate the time taken by the library to obtain the periodical on ILL.

TABLE 4BC.27: Time Taken to get a periodical needed by a run through ILL.

Time Taken	CSL(DU)	JNU	Total
Less than one week	Nil	Nil	Nil
One week	4(33.33)	Nil	4(22.22)
More than one week	8(66.67)	6(100.00)	14(77.78)
Total	12(100)	6(100)	18(100)

In CSL (DU) 33.33% respondents have indicated that library takes one week to obtain the document on ILL where as 66.67% have indicated it takes more than one week. and in JNU all the respondents have indicated ILL loan period as more than a week.

Thus the data reveals that in case of both university libraries 77.78% scientist have indicated that the library takes more than a week followed by 22.22% scientists and no scientist who have stated that library take one week and less than one week. respectively to get are periodical on ILL.

BC7 .4 REFERENCE AND INFORMATION SERVICE

The analysis` of the response to the question on provision of reference services and usefulness of different type of information services like Bibliographical service, current Awareness service (CAS), and selecting Dissemination of Information (SDI) have been given in the following Table.

TABLE 4BC 28: Provision of Different Types of Reference and Information Services by Libraries

Type of Reference Service	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
To Search Periodicals	12(63.16)	7(36.84)	4(40.00)	6(60.00)	16(55.17)	13(44.83)
To search Information	10(52.63)	9(47.37)	Nil	10(100.00)	10(34.48)	19(65.52)
Suggestions to Provide Reference Service	15(78.95)	4(21.05)	4(40.00)	6(60.00)	19(65.52)	10(34.48)

The searching of the required periodical is a minimal service and has been confirmed by 63.16% respondents in CSL (DU) and 40% in JNU whereas 44.83% scientists in both libraries under study have denied its

provision. The help provided by the library in searching specific information has been confirmed by 52.63% respondents of CSL (DU) and denied by all respondents of JNU. In all 34.48% respondents have confirmed its provision, whereas, 65.52% scientists have denied the same. With regard to their suggestion to provide reference service 78.95% respond positively compared with 34.38% respondents who have not felt its necessity and have given negative response.

The usefulness of information services has been assessed on a three point scale i.e. most useful, useful, and less useful.

TABLE 4BC.29: Respondents opinion on usefulness of Information services provided to them by Their Library

Service	CSL(DU)			JNU		
	MU	U	LU	MU	U	LU
Bibliographical Services	2(10.53)	5(26.32)	12(63.15)	1(10.00)	1(10.00)	8(80.00)
CAS	3(15.79)	5(26.31)	11(26.32)	Nil	2(20.00)	8(80.00)
SDI	Nil	4(21.05)	15(78.95)	Nil	3(30.00)	7(70.00)

In CSL (DU) bibliographical services, provided by the library have been found 'less useful' by 63.15% respondents followed by 26.32% respondents and 10.53% respondents who find this as 'useful' and 'most useful' respectively In JNU for 80% respondents bibliographical services provided by type library are 'less useful' followed by 10%, 10% respondents in 'most useful' and 'useful' current Awareness service provided by the library have been indicated as 'most useful' by 15.79% respondents of CSL (DU) and non of JNU find it 'useful'. In CSL (DU) and JNU most of the scientists i.e.

78.95% and 70% respectively have found SDI service provided by the library as 'less useful'

BC7.5 INDEXING /ABSTRACTING (I/A) SERVICES

Scientist's opinion on the frequency and adequacy of coverage in Indexing and Abstracting services has been presented in the following Table. The data gives the mixed opinion of respondents on available (I/A) service in the library and on services provided by the library.

TABLE 4BC.30: Respondents opinion on different aspects of Indexing / Abstracting Services

Service	CSL(DU)		JNU		Total	
	Yes	No	Yes	No	Yes	No
Provision to I/A Service <u>Satisfaction</u> with:	7(36.84)	12(63.16)	Nil	10(100.00)	7(24.14)	22(75.86)
Adequacy in coverage	3(15.79)	16(84.21)	Nil	10(100.00)	3(10.34)	26(89.66)
Frequency of publication	5(26.32)	14(73.68)	Nil	10(100.00)	5(17.24)	24(82.76)

The data gives the mixed opinion of respondents on available (I/A) services in the library and on services provided by the library.

TABLE 4BC.31: Time taken in providing a Document duly Xeroxed/ Photostatted by Library

Time Taken	CSL(DU)	JNU	Total
Less than an hour	1(5.26)	Nil	1(3.45)
1-3 hours	4(21.05)	Nil	4(13.79)

3-5 hours	7(36.84)	1(10.00)	8(27.59)
5-7 hours	5(26.32)	5(50.00)	10(34.48)
More than a day	2(10.53)	4(40.00)	6(20.69)

The provision of Indexing and abstracting services has been confirmed by 100% respondents in 36.84% in CSL (DU) whereas, all respondents of JNU have denied its provision in the library. In both university libraries under study 75.86% respondents have denied the provision of indexing and abstracting services.

Most of the respondents from both the libraries have denied the adequacy in coverage of indexing and abstracting services. The percentage is highest in JNU i.e. 100% followed by 84.21% in CSL (DU) Only 10.34% respondents in both university libraries have confirmed the adequacy of coverage in the indexing and abstracting services.

With regard to the frequency of publication of Indexing and Abstracting services brought out by the library 26.32% respondents in CSL (DU) no one from JNU where as, 82.76% respondents from both libraries have expressed that they are not satisfied with the services.

BC7.6 PHOTOCOPYING FACILITIES

The photocopying facilities are provided in both university libraries. The data on time taken for photocopying work has been analysed and presented in the following Table.

TABLE 4BC.32: Use of Photocopy services by respondents from other than their libraries

Respondents	CSL(DU)	JNU	Total
Yes	16(84.21)	10(100.00)	26(89.66)
No	3(15.79)	Nil	3(10.34)

In CSL 36.84% respondents have indicated that the library takes 3 to 5 hours to get photocopies of the required material followed by 26.32% scientists who have indicated the time taken as 5 to 7 hours, 19.10 %, 50% scientists of CSL (DU) have indicated this time as 1 to 3 hours and less than an hour and more than a day each. In JNU 40% scientists have indicated this time as one day, more than one day 5, 7 hours respectively

Thus according to 27.59%, 3.45%, 34.48%, 20.69% and 20.69% respondents library takes 3 to 5 hours, less than an hour, 5 to 7 hours, 1 to 3 hours and more than one day for getting the work done.

The question of using the photocopying facilities outside the library has been answered positively by 84.21% CSL (DU) 100% JNU, whereas 15.79% scientists in both libraries have denied it.

BC7.7 AVAILABILITY OF TRANSLATION SERVICE

The availability of translation service in library may contribute to enhance the use of periodicals. Thus, a question on availability of this service has been asked and almost all the respondents have denied its availability in their libraries.

BC8 USER'S OVERALL RATING

With a view to know the use of periodicals from the scientists of selected both university libraries the over all evaluation has been based on question like reading and study environment in the library, display arrangement of current periodicals, arrangement of back files of periodicals on the shelf, behavior of library staff competence of library staff and on the usefulness of periodicals collection.

Reading and study environment in selected both university libraries has also been assessed on three point scale i.e. Most congenial, congenial and Not congenial.

TABLE 4BC.33: Respondents Opinion on Reading and Study Environment in their Library

	CSL(DU)			JNU		
	MC	C	NC	MC	C	NC
Study and Reading Environment in the library	6 (31.58)	8 (42.11)	5 (26.31)	2 (20.00)	8 (80.00)	Nil

MC - Most Congenial, C - Congenial, NC - Not Congenial

In CSL (DU), 42.11% respondent have rated the reading and study environment 'congenial' followed by 31.58% and 26.31% as is 'most congenial' and 'not congenial' respectively. And JNU 80% respondents have found reading and study environment 'congenial' and 20%, who find it most congenial.

TABLE 4BC.34: Respondents Opinion on library services and attitude of library staff

	CSL(DU)			JNU		
	MH	H	NH	MH	H	NH
Display of Current Periodicals	4(21.05)	8(42.11)	7(36.84)	1(10.00)	7(70.00)	2(20.00)
Arrangement of Back files of Periodicals	6(31.58)	7(36.84)	6(31.58)	1(10.00)	8(80.00)	1(10.00)
Attitude of Library Staff	6(31.58)	9(47.37)	4(21.05)	1(10.00)	7(70.00)	2(20.00)

MH - Most Helpful, H - Helpful, NH - Not Helpful

In CSL (DU) 42.11% respondents have indicated that display of current periodicals is 'helpful' for use of periodicals, and 21.05% have indicated it as 'most helpful' whereas, 36.84% have stated to be not 'helpful'. In JNU 70% respondents have stated that the display of current periodicals is helpful. In JNU 20% and 10% respondents who have indicated that arrangement of periodicals as 'not helpful' and 'most helpful' follow it respectively.

The arrangement of back files of periodicals has been confirmed as 'most helpful' by 36.84% respondents in CSL (DU) and 10% in JNU. 31.58% in CSL (DU) and 10% in JNU find the arrangement of back files of periodicals as not helpful'.

In CSL (DU) 47.37% respondents have found behavior of library staff 'helpful' followed by 31.58% and 21.05% who find it 'most helpful and not helpful' respectively. In JNU 70% respondents find it 'helpful' followed by 10% respondents for each as 'most helpful' and 'not helpful'.

Respondents opinion about the competence of library staff to give services has been presented and analysis on three points scale in the following table.

TABLE 4BC.35: Respondents Opinion on Competence of library staff in meeting their information needs

	CSL(DU)			JNU		
	MC	C	NC	MC	C	NC
Competence of library Staff	7 (36.84)	9 (47.37)	3 (15.79)	1 (10.00)	7 (70.00)	2 (20.00)

MC - Most Competence, C -, Competence, NC - Not Competence

Most of the respondents in CSL (DU) and JNU i.e. 47.37% and 70% respectively have indicated that the staff of the library is competent to give services to readers. Whereas, 36.84% CSL (DU) and 10% JNU have said that it is 'most competent'. For 15.79% and 20% respondents of CSL (DU) and JNU respectively the staff is 'not competent' to give service.

Overall evaluation of periodical collection has also been done on a three point scale i.e. 'most useful' 'useful' and 'not useful'.

TABLE 4BC.36: Respondents Opinion on about usefulness of periodical collection

	CSL(DU)			JNU		
	MU	U	NU	MU	U	NU
Usefulness of Periodicals Collection of Library	6 (31.58)	11 (57.89)	2 (10.53)	1 (10.00)	7 (70.00)	2 (20.00)

MU - Most Useful, U – Useful, NU - Not Useful

As revealed from the above table only 31.58% respondents from CSL (DU) and 10% from JNU find their periodical collection 'most useful' whereas, the percentage of respondents who find their collection 'useful' ranges in between 57.89% and 70% whereas 10.53% and 20% respondents of CSL (DU) and JNU find the periodical collection of their library as 'not useful' find it so.

BD ANALYSIS OF QUESTIONNAIRES ADMINISTERED TO SCIENTISTS: A COMPARISON

BD1 INTRODUCTION

This part of the chapter deals with subject wise comparison of scientists response on different aspects of questionnaire i.e. their preference to use the library, the usefulness of different categories of documents availability and usefulness of periodical collection and services and provided by the libraries etc.

BD2 SAMPLE SIZE AND RESPONSE

The total population consists of 509 scientists in physics; 387 in chemistry; and 58 in Maths in CSL (DU) and JNU. The following Table gives the Comparative data of the sample.

**TABLE 4BD.1: Sample Size and Response Rate of scientists in
Physics, Chemistry and Maths**

Subject	Population	Questionnaire		Percentage Of Sample Analysed Of The Population
		Administrated	Responded	
Physics	509	154 (30.25)	104 (67.5)	20.43
Chemistry	387	152 (39.28)	110 (72.37)	28.42
Maths	58	44 (58.62)	24 (70.59)	41.37
Total	954	340(35.64)	238(68.00)	24.95

The table reveals that 110 questionnaires i.e. 72.37% of the administered questionnaires in physics 104 i.e. 67.5% in chemistry, and 24 i.e. 54.55% in Maths have been received duly filled in. It forms 20.43%, 28.42% and 41.38% of the total population in three subjects' physics, chemistry and maths respectively.

BD3 CATEGORIES OF RESPONDENTS AND THEIR ACTIVITIES

The analysis of the respondents for different categories of scientists' and fields of activities has been compared for all the three subjects in the following table.

TABLE 4BD.2: Status and Type of Activities of Respondents in Physics, Chemistry and Maths

Scientists	Physics	Chemistry	Maths
<u>Status</u>			
Faculty	20(17.70)	17(16.83)	7(24.14)
Research scholars	93(82.30)	84(83.17)	22(75.86)
Scientists(by designation)	Nil	Nil	Nil
<u>Activities</u>			
Teaching	11(10.89)	26(17.11)	8(27.59)
Research	90(89.11)	126(82.89)	21(72.41)
R&D	Nil	Nil	Nil
Management and administration	Nil	Nil	Nil
Others	Nil	Nil	Nil

Maximum percentage of respondents in the category of 'Faculty' belong to chemistry i.e. 16.83% followed by physics i.e. 17.70% and Maths i.e. 24.14% while the comparison according to absolute numbers reveals the order as physics, chemistry and maths. In the category of research scholars again the maximum percentage comes from chemistry i.e. followed by maths i.e. 75.86% and physics i.e. 82.30% whereas, the comparison of absolute number reveals the order as maths, physics and chemistry. In the comparison of scientist by designation). Physics and chemistry. Taking the comparison by percentages, it

has been found that status wise highest percentage of respondents are research scholars in chemistry 83.17% and lowest percentage of respondents is form the category faculty in Maths i.e. 24.14%.

Activity wise, teaching is an activity for 17.11% respondents in chemistry followed by 27.59% in Maths and more than 82.89% respondents in all the three subjects with 82.89% in maths 89.11% in physics and 82.89% in chemistry highest rank with 14.69% followed by mathematics

Thus the activity-wise analysis reveals that highest percentage i.e. 72.41% of respondents are engaged in research and belong to maths and the lowest percentage of respondents i.e. 27.59% also belong to maths and these are engaged in teaching activities etc.

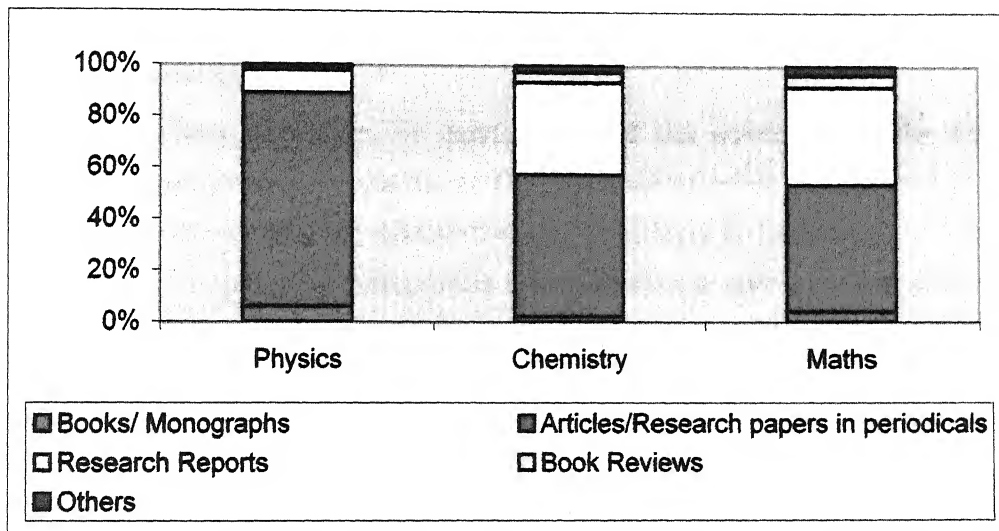
BD4 RESEARCH OUTPUT OF SCIENTISTS

The data on number and type of publications brought out by respondents during last five years i.e. from 2000/01 to 2004/05 in the field of Physics, Chemistry and Maths has been presented in the following table.

TABLE 4BD.3: Type of Publications Brought out by Respondents in Physics, Chemistry and Maths during 2000/01 – 2004/05

Type of Publication	Physics	Chemistry	Maths
Books/ Monographs	24(5.96)	12(1.96)	22(3.91)
Articles/Research papers in periodicals	334(82.88)	340(55.46)	280(49.73)
Research Reports	36(8.93)	221(36.05)	214(38.01)
Book Reviews	3(0.74)	24(3.92)	27(4.80)
Others	6(1.49)	16(2.61)	20(3.55)
Total	403(100.00)	613(100.00)	563(100.00)

CHART SHOWING THE PERCENTAGE RESEARCH OUTPUT OF SCIENTISTS FOR DIFFERENT TYPES OF DOCUMENTS



As revealed from the data in absolute number of the publication scientists in maths are most productive followed by that in Chemistry and in maths. In publishing books and monographs scientists in maths top with 5.92% followed by those in Maths 3.91% and physics i.e. 1.96 %, whereas, in publishing articles and physics i.e. 2.53%, whereas, in publishing articles and research papers scientists in chemistry top as 82.88% of their publications fall in this category followed by those in physics with 55.46% and maths with 49.73% publications. Physics again occupies first rank with 38.01% as far as the publication of 'research reports' is concerned followed by physics with 36.05% and chemistry with 8.93%. In publishing 'Book Reviews' scientists in maths occupy first rank with 4.80% followed by those in physics i.e. 3.92% and chemistry i.e. 0.74%. For publication of other types of documents, like proceedings, annual reports etc. Scientists in maths top with 3.55% publications followed by 2.61% in the field physics and 1.49% publications in the field of chemistry.

It can, therefore, be concluded that the scientists in the field of physics are most productive as far as the absolute number of publications are concerned, whereas, average productivity of scientists is highest in chemistry with 2.38 publications. Further, maths occupies first position in the percentage of publications of books/monographs and book reviews, whereas, in publishing articles/research papers, and research reports and physicists tops.

BD5 USE OF LIBRARY

BD5.1 PREFERENCE FOR USE OF A PARTICULAR LIBRARY

The respondents' preference for use of libraries in the three subjects under study has been presented in the following Table.

TABLE 4BD.4: Preference of use of a Particular Library by Respondents in Physics, Chemistry and Maths

LIBRARY	Physics	Chemistry	Maths
Own Institution	83(79.81)	91(82.73)	19(65.52)
Personal	13(12.50)	13(11.82)	7(24.14)
Other Libraries	8(7.69)	6(5.45)	3(10.34)

More than 65% respondents in all the three subjects have preferred to use their own institutional library, but the highest percentage i.e. 82.73% is from the respondents in chemistry followed by maths i.e. 79.81% and physics i.e. 65.52%. the highest percentage of scientists preferring use of personal library is in maths i.e. 6.783% followed by physics i.e. 6.64% and chemistry i.e. 5.26% Respondents in physics top in the use of other libraries with 6.16% followed by 4.03% in maths and 3.51% in chemistry. The data thus reveal that the use of institutional library is most preferred by respondents in chemistry, and for use of personal libraries respondents in maths top, and for use of institutional library is most preferred by respondents in chemistry, and for use of personal libraries respondents in maths top and for use of personal libraries respondents in physics top. Further use of institutional library is preferred by most of the respondents in all three subjects.

BD5.2 PURPOSE OF VISIT TO THE LIBRARY

Data obtained on the purpose of the scientist' visit to the library has been presented in the following Table

TABLE 4BD.5: Purpose of Visit to the Respondents to Their Institutional Library in Physics, Chemistry and Maths

Purpose	Physics	Chemistry	Maths
To Borrow and return documents	20(19.23)	38(34.54)	3(10.34)
Light Reading	7(6.73)	24(21.82)	3(10.34)
To update knowledge	24(23.08)	25(22.73)	5(17.24)
To consult documents for research	48(46.15)	18(16.36)	15(51.74)
To consult documents for teaching	5(4.81)	5(4.55)	3(10.34)

Highest percentage of respondents in chemistry visit the library to borrow and return documents i.e. 34.54% followed by those in physics and maths i.e. 19.23% and 10.34% respectively, and the highest percentage of respondents visiting the library for light reading again is from chemistry i.e. 21.82% followed by 10.34% in maths and 6.73% in physics. Among the respondents visiting library to update knowledge and to consult documents for research physics top with 23.08% and 46.15% respectively followed by Maths with 17.24% and 51.74% and chemistry with 22.73% and 16.36% respectively. Respondents in maths top with 10.34% among those visit the library to consult documents for teaching followed by respondents in physics and those in chemistry with 4.81% and 4.55% respectively.

Thus more than 30% respondents in chemistry visit the library to consult the documents for research to update their knowledge.

BD5.3 FREQUENCY OF VISIT TO THE LIBRARY

The data on frequency of visits by scientists in chemistry, physics and Maths to their institutional library has been presented in the following table.

TABLE 4BD.6: Frequency of Visit by the Respondents to Their Institutional Library in Physics, Chemistry and Maths

Frequency Of Visit	Physics	Chemistry	Maths
Daily	24(23.08)	39(35.45)	3(10.34)
Twice a week	32(30.77)	31(28.18)	12(41.38)
Once a week	37(35.58)	23(20.92)	9(31.03)
Occasionally	21(20.19)	17(15.45)	5(17.25)
Never	Nil	Nil	Nil

Percentage of daily visitor is highest in chemistry whereas; those visiting twice a week and once a week are highest in maths and physics. Respondents of physics top in occasional visits with 20.19% respondents. However, no respondents in all subjects never visit the library.

It can, therefore, be said, that the scientists in Chemistry and physics are more frequent visitors to the library than those in Math's.

The reasons for irregular visits by scientists in Physics, Chemistry and Maths have been compared in the following table.

TABLE 4BD.7: Reasons for Irregular Visits by Respondents in Physics, Chemistry and Maths to Their Institutional Library

REASONS FOR IRREGULAR VISITS	Physics	Chemistry	Maths
Far away from place of work	Nil	Nil	Nil
Far away from place of residence	2(9.52)	3(27.28)	2(40.00)
Working hours not convenient	5(23.82)	4(36.36)	3(60.00)
Collection does not meet information needs	12(57.14)	4(36.36)	Nil
Environment not congenial	2(9.52)	Nil	Nil

Library is far away from place of residence, according to 40% respondents in maths. Again 60% scientists working in the field of maths, 36.36% in physics and 23.81 in chemistry feel that library hours are not convenient to them. The highest percentage of respondents, who have indicated that collection does not meet their information needs, are in physics i.e. 57.14 followed by 36.36% and no respondents in chemistry and maths respectively. Environment is not congenial for reading and study is the deterrent factor for 9.52% respondents and in physics and no respondents in chemistry and maths.

Thus for scientists working in the field of maths the deterrent factor are that 'library is far away from place of residence', it is far away from place of residence'. Its working hours are not convenient; In addition to these

their document collection does not most information needs. In maths is that library is far away from place of work. For most of the irregular visitors in physics library collection does not meet information needs is the reason for their irregular visits.

BD5.4 TIME SPENT ON READING

The data on time spent on reading inside the library has been analysed and compared for four groups i.e. less than 10 hours, 11 to 20 hours, 11 to 20 hours, 21 to 30 hours, 21 to 30 hours and above 30 hours per week.

TABLE 4BD.8: Time Spent of Reading and Study by Respondents in Their Institutional Library

Hours per week	Physics	Chemistry	Maths
Less than 10 hours	47(45.19)	76(69.09)	12(41.38)
11 to 20 hours	29(27.88)	25(22.73)	9(31.03)
21 to 30 hours	8(7.69)	5(4.54)	3(10.35)
above 30 hours	20(19.24)	4(3.64)	5(17.24)

The highest percentage of respondents who spent less than 10 hours per week in the library for reading and study purpose is in chemistry i.e. 69.09% followed by physics i.e. 45.19% and Math's i.e. 41.38% in 10 to 20 hours group again the respondents from Math's top with 31.03% followed by those in physics i.e. 27.28% and chemistry i.e. 22.73% Respondents in Math's top with 10.35% in the group of scientists spending 21 to 30 hours per week followed by those in physics and chemistry i.e. 7.69% and 4.54% respectively.

Respondents in physics top in the group of scientists spending above 30 hours on reading and study inside the library.

The overall analysis of the data reveals that comparatively higher percentage of respondents in chemistry and Math's Respectively spend less hours (i.e. less than 10 hours and 11 to 20 hours) on reading and study inside the library, whereas, comparatively more percentage of respondents in Math's and Physics spend more hours (21 to 30 hours) and above 30 hours) on reading inside library.

BD 6 USEFULNESS OF DIFFERENT TYPES OF DOCUMENTS

The usefulness of different categories of documents has been measured on three point scale in all the three subjects under study.

TABLE 4BD.9: Respondent's Perception on Usefulness of Different Types of Documents in Physics, Chemistry and Math's

Types of Document	Physics			Chemistry			Maths		
	MU	U	LU	MU	U	LU	MU	U	LU
Books/Monographs	22(21.15)	30(28.85)	52(50.00)	24(21.82)	74(67.27)	12(10.91)	4(13.79)	8(27.59)	17(58.62)
Handbooks/data Compilations	11(10.58)	42(40.38)	51(49.04)	12(10.91)	56(50.91)	42(38.18)	2(6.90)	7(24.14)	20(68.96)
Indexes/abstracts	48(46.15)	50(48.08)	6(5.77)	65(59.09)	38(34.55)	7(6.36)	9(31.03)	16(55.17)	4(13.79)
Periodicals	75(72.11)	25(24.04)	4(3.85)	95(86.36)	9(8.18)	6(5.45)	21(72.41)	6(20.69)	2(6.90)
Patents/Standards/Specifications	Nil	8(7.69)	96(92.31)	8(7.27)	37(33.64)	65(59.09)	Nil	6(20.69)	23(79.31)
Conference Proceedings	44(42.31)	47(45.19)	13(12.5)	14(12.73)	51(46.36)	45(40.91)	14(48.28)	12(41.38)	10(34.34)
Research Reports	40(38.46)	55(52.88)	9(8.66)	61(55.45)	39(35.46)	10(9.09)	10(34.48)	16(55.17)	3(10.35)
Dissertations & Thesis	2(1.92)	45(43.27)	57(54.81)	19(17.27)	59(53.64)	32(29.09)	1(3.45)	16(55.17)	12(41.38)
Trade Literature	Nil	8(7.69)	96(92.31)	5(4.55)	17(15.45)	88(80.00)	Nil	7(24.14)	22(75.86)
Review Literature	51(49.04)	49(47.11)	4(3.85)	72(65.45)	28(25.45)	10(9.10)	14(48.28)	11(37.93)	13(43.79)

MU – Most Useful; U – Useful; LU – Less Useful

The highest percentage of respondents- indicating books and monographs as 'most useful' comes from Chemistry i.e. 21.82% whereas, 67.27% respondents in Chemistry and 28.85% in Physics have indicated these as 'useful'. Handbook and data compilations all 'most useful', 'useful' and 'less useful' according to 10.91% respondents in Chemistry 50.91% in Chemistry, and 68.96% in Math's respectively. The highest percentage of respondents finding Indexes and Abstracts as 'most useful' are from Chemistry i.e. 59.09%, whereas 55.17%, and 5.77% respondents in Math's and Physics find these 'useful' and 'less useful' respectively. Periodicals have been indicated as 'most useful' by above 72.00% respondents in each of the three subjects i.e. 86.36% in Chemistry 72.41% in Math's and 72.11% in Physics whereas, 24.03% respondents in Physics 20.69% in Math's, and 8.18% respondents in Chemistry find periodicals' useful Patents/ Standards/ specifications have been indicated As 'less useful', by most of the scientists in all the three subjects. However, 7.69% scientists in Physics find these 'most useful', 33.64% scientists in Chemistry find them 'useful'. The highest percentage of respondents who find Conference Proceedings 'most useful' and 'useful' are from Math's and Physics i.e. 48.28% and 46.36% respectively whereas, 40.91% respondents in Chemistry find this category of documents 'less useful'. More than 30% respondents in Chemistry and Math's, i.e. 55.45% and 55.17% find research reports 'most useful' whereas most of those in Physics i.e. 52.88% find this category 'useful'. Very few respondents in all the three subjects i.e. 17.27% in chemistry, 3.45% in Math's and 1.92% in Physics have indicated that Dissertations and Theses as 'most useful'. This category of documents has been indicated as 'less I useful' by most of the respondents in Physics i.e. 54.81%; whereas, 55.17% respondents in Math's, and 54.81% in Math's and this category as 'useful'. Trade Literature has also been found 'less useful' by 92.31% respondents in Physics, 80.00% in Chemistry, and 75.86% in Math's only 24.14% respondents in Math's and 7.69%5 in Physics find Trade Literature as 'most useful'. Review Literature has been indicated as 'most useful' by 65.45% respondents in Chemistry, 49.04% in Physics and 48.28% respondents

in Math's and 'useful' by 47.11% in Physics and 37.93% in Math's and 25.45% respondents in Chemistry whereas, 13.79% in Math's find it 'less useful'.

Thus the order of priority of usefulness of a particular type of document by scientists in Chemistry is periodicals, indexes and abstracts, review literature, and research reports as 'most useful'; and books and monographs, handbook and data compilations, conference proceedings, dissertations and theses as 'useful'. For scientists in Physics periodicals, and review literature is most Useful' categories of documents, whereas, books/monographs handbooks` and data compilations, indexes and abstracts,' conference proceedings, research reports have' been identified as 'useful' by majority of respondents. Patents/ Standards/ specifications, dissertations and theses, and trade literature have been indicated as 'less useful' by most of the respondents in physics. In Besides indexes and abstracts, periodical, research reports are found as 'most useful', by more percentage of the respondents, whereas books/monographs, handbooks and data compilations, conference proceedings, dissertations and theses have been indicated as 'useful'. Patents/ Standards/ Specifications, II trade literature and review literature are 'less type of documents to them.

BD7 USE OF PERIODICALS

BD7.1 PURPOSE OF USING PERIODICALS

Scientists use current and back issues of periodicals with different purposes in view. The comparison of the three subjects has been presented in the Table 4BD.10

Scientists in Chemistry i.e. 31.82% top in use of current issues of periodicals for browsing and updating information followed by those in physics i.e. 31.73% and math's 24.14%. Research work is the purpose for using current periodicals for 45.45%, 41.38%, 41.35% respondents' in

TABLE 4BD.10: Purpose of using current and Back Files of Periodicals by Scientists in Physics, Chemistry and Math's

Purpose	Physics	Chemistry	Maths
<u>Current Periodicals</u>			
Browsing and updating information	33(31.73)	35(31.82)	7(24.14)
Research work	43(41.35)	50(45.45)	12(41.38)
Class room teaching	9(8.65)	12(10.91)	3(10.34)
Information search	19(18.27)	13(11.82)	7(24.14)
<u>Back files of Periodicals</u>			
Research work	66(63.46)	79(71.82)	17(58.62)
Class room teaching	10(9.62)	13(11.82)	2(6.90)
Information search	28(26.92)	18(16.36)	10(34.48)

Chemistry, math's and physics respectively, whereas, in use of current periodicals for class room teaching scientists in chemistry i.e.10.91% occupy the first rank followed by math's i.e.10.34% and Physics i.e. 8.65%. Again for information search the highest percentage of respondents comes from the field of math's i.e. 24.14%, followed by 18.27% in Physics and 11.82% in Chemistry.

The back files of periodicals are used by more than 58% respondents for reseach work. The highest being in chemisty 71.82%, followed by physics 63.46% and maths 58.62%. class room Teaching as the purpose for using back files of periodicals has been revealed by 11.81% scientists in Chemistry, 9.62% in physics and 6.90% in math's; whereas, information search

is the purpose for 34.48% respondents in math's followed by 26.92% in physics and 16.36% in Chemistry.

The overall comparative analysis of purpose of use of current issues of periodicals reveals that maximum number of scientists use periodicals for research work, followed by browsing and updating knowledge, searching specific information and class room teaching in all the three subjects. Whereas, back files of periodicals are used for research work by maximum number of respondents followed by searching specific information, and class room teaching the subjects under study i.e. Physics, Chemistry and Math's.

BD7.2 SOURCES INITIATING THE RESPONDENTS FOR ACCESS AND USE OF A PERIODICAL

Responses from scientists in Physics, Chemistry and Maths on initiating sources the use of a particular periodical has been compared and presented in the following table.

TABLE 4BD.11: Sources Initiating the Respondents for Access to a Periodical in Physics, Chemistry and Maths

Source	Physics	Chemistry	Maths
Direct Browsing	25(24.04)	18(16.36)	7(24.14)
Indexing/ Abstracting	25(24.04)	39(35.45)	5(17.24)
Citations	26(25.00)	25(22.73)	11(37.93)
Discussions with colleagues	18(17.31)	16(14.55)	4(13.79)
Attending Conference	8(7.69)	9(8.18)	2(6.90)
Invisible college	2(1.92)	3(2.73)	Nil

Browsing initiates for access and use of a particular periodical to 24.14% respondents in math's, 24.04% in Physics and 16.36% in chemistry whereas, 35.45% scientists in Chemistry are initiated through indexing and abstracting sources followed by 24.04% in physics and 17.24% in math's. Further, 37.93% respondents in math's followed by 25% in physics and 22.73% in chemistry are initiated by citations colleagues and attending conferences, and seminars are other sources which initiates 17.31%, and 8.18% scientists respectively in physics followed by 13.79% and 7.69% in physics, and 14.55% and 6.90% respectively in math's. The invisible college gets lowest rank as an initiating factor to use a particular periodical in all the three subjects with 2.73%, 1.92% and no respondents in math's.

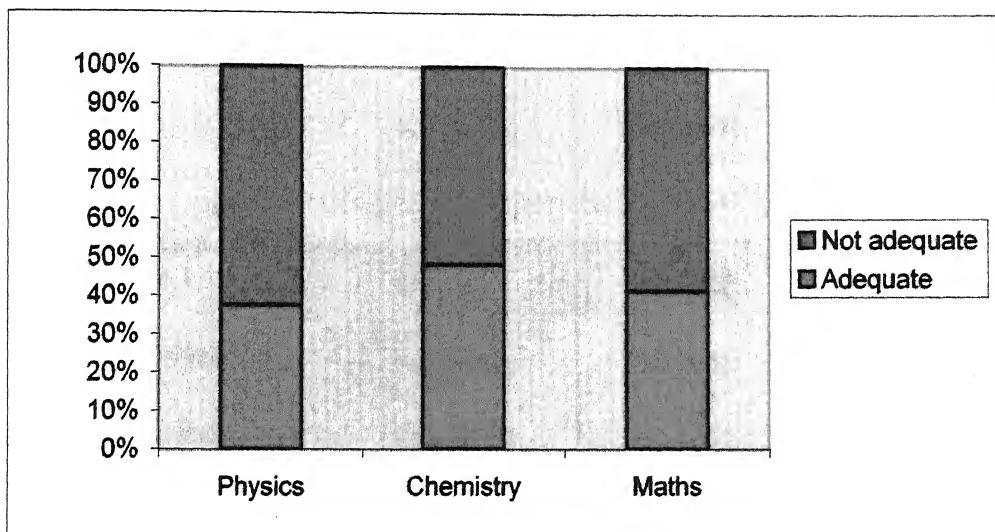
BD7.3 PERIODICALS' COLLECTION

The respondent's opinion on the adequacy of periodical collection to meet their information needs has been compared in the following table.

TABLE 4BD.12: Opinion of Respondents on Adequacy of Periodical in Physics, Chemistry and Math's

Adequacy of Periodicals' Collection	Physics	Chemistry	Maths
Yes	39(37.50)	53(48.18)	12(41.38)
No	65(62.50)	57(51.82)	17(58.62)

CHART SHOWING THE SCIENTIST OPINION ON ADEQUACY OF PERIODICAL COLLECTIONS



Periodicals' collection have been found adequate by 48.18% respondents in chemistry, followed by 41.38% in math's and 37.50% in physics, Whereas 62.50% respondents in Physics, 58.62% in math's and above 51.82% in chemistry do not find periodical collection in their libraries adequate to meet their information needs.

For inadequate periodicals' collection scientists adopt different alternatives to use a periodical. The analysis of opinion has been compared in the following Table.

TABLE 4BD.13: Alternative Methods Used by respondents for Using Periodicals in Physics, Chemistry and Maths

Alternative Methods	Physics	Chemistry	Maths
Consulting Periodicals in other Libraries	30(46.15)	38(66.67)	8(47.06)
Borrowing Personally from other Libraries	6(9.23)	6(10.53)	1(5.88)
Inter Library Loan	14(21.55)	4(7.02)	4(23.53)
Requesting Author to Send Reprint	10(15.38)	7(12.28)	3(17.65)
Abandon the Search	5(7.69)	2(3.50)	1(5.88)
Total	65(100.00)	57(100.00)	17(100.00)

Consulting periodicals in other libraries as an alternative is used by highest percentage of respondents in Chemistry i.e. 66.67% followed by 47.06% in math's and 46.15% in Physics. Periodicals are borrowed personally from other libraries for Use by 10.53% respondents in, 9.23% in physics and 5.88% in math's, whereas 23.53% respondents in math's, followed by 21.54% in physics and 7.02% in chemistry borrow them through inter-library loan. 17.65% respondents in math's, 15.38% in physics and

12.28% in Chemistry prefer to request the author to send the reprint of the article and only 7.69%, 5.88%, 3.50% scientists in the field of Physics, math's and Chemistry respectively abandon the search in case of non availability of the needed periodical.

Thus the comparison of the data reveals that in case of non availability of periodical in one's own institutional library, most of the scientists in all three subjects consult periodicals in other libraries. In Chemistry it is followed by the alternative likes borrowing personally from other libraries(10.53%), requesting library for obtaining it on inter library loan (7.02%), requesting the author to send the reprint (12.28%), etc. In Physics, 15.38% I scientists request author to send reprint followed by 21.55% getting it on inter library loan, and 9.23 % borrowing personally from other libraries. In math's requesting author, to send reprint is used as an alternative method by 17.65%, borrowing personally from other libraries by 5.88% and inter library loan by 23.53% scientists, etc.

Subject wise response of scientists on the question of requesting library to subscribe to a new periodical and its subscription by the library has been presented in the following Table.

TABLE 4BD.14: Number of Respondents who have requested the Library to Subscribe to a New Periodicals and Subscription to Requested Periodicals in Physics, Chemistry and Math's

Subject	Requested to subscribe to a New Periodical		Subscription to Requested Periodical	
	Yes	No	Yes	No
Physics	38(36.54)	66(63.46)	3(7.89)	35(92.11)
Chemistry	53(48.18)	57(51.82)	7(13.21)	46(86.79)
Maths	10(34.48)	19(62.52)	2(20.00)	8(80.00)

The data reveals that 48.18% scientists in the chemistry 36.54% in physics, 34.48% in maths have requested the library to subscribe to new periodicals and only 13.21%, 7.89% and 20% scientists in Chemistry, Physics and respectively have confirmed that the library has subscribed to the requested periodical. However, 92.11% in respondents in physics 86.79% in chemistry and 80% in math's have denied the subscription by the library.

Subject wise response on the reasons for not subscribing to the requested periodicals, as indicated by scientists has been compared' in the following Table.

TABLE 4BD.15: Reasons for not subscribing to the Requested Periodicals

Reason	Physics	Chemistry	Maths
Lack of Funds	27(77.14)	23(50.00)	4(50.00)
Non Approval by Authorities	5(14.29)	8(17.39)	3(37.50)
Working/ Sharing Arrangement Done	Nil	7(15.22)	Nil
Request not Looked in to	Nil	2(4.35)	Nil
Others	3(8.57)	6(13.04)	1(12.50)
Total	35(100.00)	46(100.00)	8(100.00)

Lack of funds is the reason for not subscribing to the suggested periodical for 77.14% respondents in Physics, 50% in math's and 50% in Chemistry 37.50% respondents in math's, have also indicated that new subscription was not approved by the authorities and authorities did not approve subscription for 14.29% and 37.50%; and request was not looked into for no respondents respectively in physics and math's.

BD7.4 USE Vs FORMS OF PERIODICALS

Subject wise response of scientists on use of periodicals in other than printed form and their types is presented in the tables below:

TABLE 4BD.16: Extent of Use of Periodicals by Respondents in Non Conventional forms (other than Printed Form) by Scientists in Physics, Chemistry and Maths

Use of Periodicals in other than Printed form	Physics	Chemistry	Maths
Yes	97(93.27)	99(90.00)	26(89.66)
No	7(6.73)	11(10.00)	3(10.34)
Total	104(100.00)	110(100.00)	29(100.00)

The data reveals less than 12% in all subjects only 10.94% scientists in math's 10% in Chemistry and only 6.73% in Physics use periodicals in other than printed form and more than 90% in physics, chemistry and math's respondents used Non print form i.e. E-Journals, CD-ROM and so on.

BD7. 5 USE Vs LANGUAGE

The use is related to the language of the periodical, and the scientists in all three subjects give weightage to language for use of periodicals will English is the most preferred language of scientists in all the three subjects of study, However, 0.88% scientists in Chemistry prefer German language, whereas, 0.90% scientist in the field of physics use periodicals in Hindi Language.

BD 7.6 USE Vs COUNTRY OF ORIGIN

Scientists generally give weightage to the country of origin for using a periodical. The comparison of response of on weightage given to country of origin has been given in the following Table.

TABLE 4BD.17: Weightage given to the Country of origin of Periodicals by Respondents in Use of a Periodical in Physics, Chemistry and Maths

Weightage to Country of Origin	Physics	Chemistry	Maths
Yes	68(65.68)	81(73.64)	20(69.97)
No	36(34.62)	29(26.36)	9(31.03)
Total	104(100.00)	110(100.00)	29(100.00)

Scientists in Physics with 73.64% response rank at the top in giving weightage to the country of origin followed by those in math's i.e. 68.97%, and 65.38% in physics.

TABLE 4BD.18: Respondents preference for use of Indian/ Foreign Periodicals in Physics, Chemistry and Math's

Country of Origin	Physics	Chemistry	Maths
Indian	5(7.35)	28(34.57)	2(10.00)
Foreign	63(92.63)	53(65.43)	18(90.00)
Total	68(100.00)	81(100.00)	20(100.00)

Further, on the question of weightage given to, periodicals of Indication and Foreign Origin, it has been found from amongst those who give weightage to country of origin more than 65% respondents have indicated that they prefer to use periodicals published from foreign countries, whereas 34.57% scientists in chemistry; 10 % in math's and 7.35% in Physics prefer to use, periodicals published from India.

BD7.7 USE Vs TYPE OF PUBLISHER

The weightage or preference given to the type of publisher of a periodical by the scientists in Physics, Chemistry and math's has been presented in the following Table.

TABLE 4BD.19: Weightage given by Respondents to type of Publisher in Periodicals in Physics, Chemistry and Math's

Weightage to Type of Publisher	Physics	Chemistry	Maths
Yes	62(59.62)	43(39.09)	17(58.62)
No	42(40.38)	67(60.91)	12(41.38)
Total	104(100.00)	110(100.00)	29(100.00)

The highest percentage weightage to the publisher is given by scientists in Physics i.e. 59.62% followed by math's i.e. 58.62% and Chemistry i.e. 39.09%.

TABLE 4BD.20: Type of Publisher Preferred by Respondents in Use of Periodicals in Physics, Chemistry and Math's

Type of Publisher	Physics	Chemistry	Maths
Learned Society	22(35.48)	11(25.58)	5(29.41)
Academic/ Research Institute	38(61.29)	29(67.44)	12(70.59)
Government	2(3.23)	3(6.98)	Nil
Commercial	Nil	Nil	Nil
Total	62(100.00)	43(100.00)	17(100.00)

Out of scientists who give weightage to publishers 35.48% respondent in physics, 29.41 in maths and 25.50% in chemistry have indicated the preference for learned societies, whereas, 70.59% scientists in maths, 67.44% in chemistry and 61.29% in physics prefer to use periodical brought out by academic and research institutions. It is only less than 7% scientists in all the three subjects who prefer to use periodicals by the Government or Commercial agencies.

BD 8 LIBRARY SERVICES

BD8.1 AWARENESS OF LIBRARY SERVICES

The scientists in subjects under study are not fully aware of the services provided by their own library. Subject wise comparison on the awareness of different library services provided has been given in the Table BD4. 21.

More than 79% scientists in the three subjects are aware of lending services being provided by their own library, whereas, provision of Inter Library Loan services is known to 90% respondents in chemistry, 89.42% in physics and 79.31% in maths. Respondents in Physics perhaps

use reference service more as the highest percentage i.e. 84.61% in this category are aware of this service followed, by 82.76% in maths and 69.09% in Chemistry. Bibliographical services provided by their own library are known to 59.62%, 50.90% and 48.28% scientists in Physics, Chemistry and maths. In case of CAS, SDI and I/A services again respondents in Physics top with 52.88%, 57.69% and 77.88% respectively, followed by those in maths with 48.28%, 51.72%, 58.62%, and Chemistry with 51.82%, 10.91% and 58.18%,

TABLE 4BD.21: Respondents' Awareness of Different Library Services provided by the Institution

Type of Service	Physics		Chemistry		Maths	
	Yes	No	Yes	No	Yes	No
Lending	93(89.42)	11(10.58)	99(90.00)	11(10.00)	23(79.31)	6(20.69)
Inter Library Loan	76(73.08)	28.(26.92)	40(36.36)	70(63.64)	20(68.97)	9(31.03)
Reference	88(84.61)	16(15.38)	76(69.09)	34(30.91)	24(82.76)	5(17.24)
Bibliographical	62(59.62)	42(40.38)	56(50.90)	54(49.10)	14(48.28)	15(51.72)
CAS	55(52.88)	49(47.12)	57(51.82)	53(48.18)	14(48.28)	15(51.72)
SDI	60(57.69)	44(42.31)	12(10.91)	98(89.09)	15(51.72)	14(48.28)
I/A	81(77.88)	23(22.12)	64(58.18)	46(41.82)	17(58.62)	12(41.38)
Photocopying	100(96.15)	4(3.85)	101(51.82)	9(8.18)	27(93.10)	2(6.90)
Translation	35(33.65)	69(66.35)	Nil	110(100)	3(10.34)	26(89.66)

respectively. More than 91% respondents in all the three subjects are aware of provision of photocopying services by the libraries, whereas in case of translation service only 33.65% respondents in Physics 10.34% in math's and 1.75% in Chemistry are not aware of this service.

It can, therefore, be concluded that scientists Physics are most aware of the library services followed by those in math's and Chemistry. Moreover, lending and photocopying services are most known services and translation service is least known. However, among other, services, ILL, Reference, and I/A services are better, than CAS and SDI services perhaps because of their absence.

BD 8A LENDING SERVICES

Lending of current and back files of periodicals has been compared in the following Table.

TABLE 4BD.22: Provision of Lending Service for current and Back Files of Periodicals to Scientists in Physics, Chemistry and Maths

Lending of Periodicals	Physics		Chemistry		Maths	
	Yes	No	Yes	No	Yes	No
Current Issues	41(39.42)	63(60.58)	5(4.55)	105(95.45)	5(17.24)	24(82.76)
Back Files	48(46.15)	56(53.85)	13(11.82)	97(88.18)	9(31.03)	20(68.97)

Lending of current issues of periodicals has been confirmed by 39.42% respondents in physics 17.24% in maths and 4.55% in Chemistry, whereas lending of back files of periodicals has been confirmed by 46.15% respondents in physics 31.03% in maths and 11.82% in Chemistry.

Subject wise opinion of scientists in all the three fields for issue of current and back files of periodicals has been given below:

TABLE 4BD.23: Respondents Opinion on Whether Current and Back Files of Periodicals be Loaned or Not In Physics, Chemistry and Math's

Periodicals	Physics		Chemistry		Maths	
	Yes	No	Yes	No	Yes	No
Current Issues	34(32.69)	70(67.31)	26(23.64)	84(32.69)	7(24.14)	22(75.86)
Back Files	78(75.00)	26(25.00)	84(76.36)	26(23.64)	24(82.76)	5(17.24)

More than 67% respondents in maths and Physics have suggested not to loan out current issues of periodicals, whereas 23.64% in Chemistry have suggested that the current issues of periodicals should be loaned out. The back files of periodicals have been suggested for being loaned out by more than 75% respondents in all the three subjects, highest being in Chemistry with 82.76% followed by maths with 76.36% and 75% in physics.

BD8 B INTER LIBRARY LOAN

Subject wise response on the provision of Inter Library Loan has been presented in the following Table.

**TABLE 4BD.24: Provision of ILL Service for Periodicals with
Different Libraries**

Provision of ILL	Physics	Chemistry	Maths
Yes	60(57.69)	30(27.27)	18(62.07)
No	44(42.31)	80(72.73)	11(37.93)
Total	104(100.00)	110(100.00)	29(100.00)

Inter library loan services have been confirmed by 62.07%, respondents in maths whereas, 72.73% in chemistry and 37.93% in maths have stated that library does not obtain periodicals on inter library loan.

On the time period taken to obtain periodical on inter library loan, subject wise response of scientists have been presented in the Table 4BD.25.

**TABLE 4BD.25: Time Taken to Get a Periodical needed by Scientists
Through ILL**

Time Taken	Physics	Chemistry	Maths
Less than a Week	Nil	2(6.67)	Nil
One Week	21(35.00)	8(26.67)	4(22.22)
More than a Week	39(6.00)	20(66.66)	14(77.78)
Total	60(100.00)	30(100.00)	18(100.00)

Amongst the respondents who have confirmed that the library obtains periodicals on inter library loan, for them the highest percentage of respondents who have indicated that the library takes less than one week to Obtain a periodicals on inter library loan is from Chemistry i.e. 6.67%, maths and physics is no respondents. According to 35% respondents in physics,

26.67% in chemistry, and 22.22% in maths it takes one week, whereas, 77.78% in maths, 66.66% in Chemistry and 65% respondents in physics have indicated that library takes more than a week to obtain periodicals on inter library loan.

BDSC REFERENCE AND INFORMATION SERVICES

Libraries provide different types of reference service to their users. Respondents have been asked indicate their usefulness and the data has been analysed and compared in the following Table.

TABLE 4BD.26: Provision of Different Types of Reference and Information Services According to Respondents in Physics, Chemistry and Maths

Type of Reference Service	Physics		Chemistry		Maths	
	Yes	No	Yes	No	Yes	No
To Search Periodical	68(65.38)	36(34.62)	91(82.73)	19(17.27)	16(55.17)	13(44.83)
To Search Information	49(47.12)	55(52.88)	62(56.36)	48(43.64)	10(34.48)	19(65.52)
Suggestions to Provide Reference Service	85(81.38)	19(18.27)	80(72.73)	30(27.27)	19(65.52)	10(34.48)

Help provided by the library staff to search the periodicals has been confirmed by most of the scientists all the three subjects i.e. 82.73% in chemistry, 65.38% in physics, and 55.17% in maths, whereas, assistance provided to search specific information has been confirmed by 56.36%

respondents in chemistry 47.12% in Physics and 34.38% in maths.

However, 65.52% respondents in maths, 52.88% in Physics and 43.64% in chemistry have denied its provision. with regard to provision of reference service 81.73% respondents from physics, 72.73% from chemistry and 65.52% from maths have suggested that reference service should be provided and only 27.27%, 18.27% and 34.48% respondents in Chemistry, Physics and maths have stated that it may not be provided.

The usefulness of bibliographical, CAS and SDI services has been analysed and presented in the following Table.

TABLE 4BD.27: Respondents Opinion on Usefulness of Information Services Provided to Scientists by the Libraries under Study

Information Services	Physics			Chemistry			Maths		
	MU	U	NU	MU	U	NU	MU	U	NU
Bibliographical	7(6.73)	19(18.27)	78(75.0)	2(1.82)	21(19.09)	87(79.09)	3(10.34)	6(20.69)	20(68.97)
CAS	7(6.73)	25(24.04)	72(69.23)	4(3.64)	37(33.64)	69(62.72)	3(10.34)	7(24.14)	19(65.52)
SDI	Nil	16(15.38)	88(84.62)	Nil	25(22.73)	85(77.27)	Nil	7(24.14)	22(75.86)

MU Most Useful, U Useful, NU Not Useful

Scientists in maths rank at the top with 10.34% respondents are indicating that bibliographical services provided by library as 'most useful'. It is followed by respondents in Chemistry, and Physics i.e. 1.82%, and 6.73% respectively, whereas this service has been indicated as 'useful' by 19.09% respondents in Chemistry, 18.27% in Physics, and 20.69% maths. CAS has been indicated as 'most. Useful' comparatively by more number of scientists i.e. 10.34% in maths, 6.73% in physics and 3.64% in chemistry. However, a larger percentage of scientists in physics i.e. 69.23%, and in maths i.e. 65.52% find

CAS 'not useful', whereas in chemistry 33.64% respondents find this service as 'useful'. SDI service has been indicated 'not usefull' by more than 75% respondents in physics, chemistry and maths.

It can therefore, be concluded that bibliographical, CAS and SDI services have been indicated as 'most useful' and 'useful' by less percentage of scieintists in all the three fields. However, comparativley more number of scienitists in maths than in chemistry, and Physics find these services 'most useful' and 'useful'

BD8D INDEXING AND ABSTRACTING (I/A) SERVICES

Provision of I/A services and satisfaction of scientists on the frequency and adequacy in coverage of these services has been compared in the following table.

TABLE 4BD.28: Respondents Opinion on different Aspects of Indexing/abstracting services in Physics, Chemistry and Math's

Services	Physics		Chemistry		Math's	
	Yes	No	Yes	No	Yes	No
Provision of I/A Service	28(26.92)	76(73.08)	56(50.91)	54(49.09)	7(24.14)	22(75.86)
Satisfaction With	6(5.77)	98(94.23)	47(42.73)	63(57.27)	3(10.34)	26(89.66)
Adequacy in Coverage						
Frequency of Publication	23(22.12)	81(77.88)	1(46.36)	59(53.64)	5(17.24)	24(82.76)

Only 50.91, 26.92% and 24.14% respondents in chemistry, physics and maths respectively have confirmed their satisfaction on the provision of I/A services in libraries, whereas, more than 53% respondents in all the three subjects are not satisfied with the frequency of these services and more than 57% respondents have revealed their dissatisfaction on adequacy of coverage in these services. Only 46.36% and 42.73% respondents in chemistry, 22.12% and 5.77% in physics, and 17.24% and 10.34% in maths are satisfied with the frequency of publication, and on adequacy of coverage in indexing and abstracting services respectively.

BDSE PHOTOCOPYING FACILITIES

Time Taken in providing the photocopies affects the use of periodicals. The comparative response of the scientists on this aspect have been analysed and presented in the following Table 4BD.29

50% scientists in chemistry have indicated that library takes less than an hour for photocopying work, whereas, according to 15.45%, 12.73% and 8.18% and 13.64% takes 1-3 hours, 3 to 5 hours and 5 to 7 hours and more than a day respectively. In physics, according to 30.77% scientists library takes 3 to 5 hours to get the work done

TABLE 4BD.29: Response of Scientists on Time Taken in Providing a Document Duly Xeroxed/ Photostatted by Library

Time Taken for Photostat	Physics	Chemistry	Maths
Less than an hour	10(9.62)	55(50.00)	1(3.45)
1 to 2 hours	17(16.35)	17(15.45)	4(13.79)
3 to 5 hours	32(30.77)	14(12.73)	8(27.59)
5 to 7 hours	28(26.92)	9(8.18)	10(34.48)
More than a day	17(16.34)	15(13.64)	6(20.69)

Whereas 9.62% and 26.92%, 16.35%, 16.34% respondents in physics say that library takes less than an hour, 5 to 7 hours, 1 to 3 hours and more than a day respectively. In maths 34.48% and 3.45% scientists have indicated that library takes 5 to 7 hours and less than an hour respectively to get the photocopy work done, whereas for 20.69%, 27.59% and 13.79% respondents in maths it takes more than a day, 3 to 5 hours and one to three hours respectively.

TABLE 4BD.30: Use of Photocopying Services by Respondents from other than Their Libraries

	Physics	Chemistry	Maths
Yes	94(90.38)	98(89.09)	26(89.66)
No	10(9.62)	12(10.91)	3(10.34)
Total	104(100.00)	110(100.00)	29(100.00)

On the question of using photocopying services provided by agencies out side the library most of the scientists have confirmed positively. The percentage of these scientists are 90.38% in physics, 89.66% in maths and 89.09% in chemistry, whereas, 10.91% respondents in chemistry 10.34% in maths and 9.62% in physics have given negative response.

. BD8F AVAILABILITY OF TRANSLATION SERVICE

All the respondents in Maths and above 90% in maths have denied the availability of translation service in their respective library. It is only in physics that 16.12% respondents have confirmed its availability.

BD9 USERS' OVERALL RATING

In order to assess the overall opinion of the scientists with regard to the library services, competence of library staff and so on. The data has been collected as these reflect the use of periodicals and analysed and presented in the following tables

TABLE 4BD.31: Respondents Opinion on Reading and Study Environment in Their Institutional Libraries

Reading Environment	Physics			Chemistry			Maths		
	MC	C	NC	MC	C	NC	MC	C	NC
Reading Environment in the Library	32(30.77)	50(48.08)	22(21.15)	25(22.73)	81(73.64)	4(3.63)	8(27.59)	16(55.17)	5(17.24)

MC Most Congenial, C Congenial, NC Not Congenial

Majority of scientists in all the three subjects find reading and study environment in libraries congenial. The percentage of these scientists is 73.64% in chemistry, 55.17% in maths and 48.08% in physics, whereas, 30.77% in physics, 27.59% in maths and 22.73% in chemistry find reading and study environment 'most congenial'. Only 3.63% respondents in chemistry, 21.15% in physics and 17.24% in maths have indicated that reading and study environment is not 'congenial'.

TABLE 4BD.32: Respondents Opinion on Library Services and Attitude of Library Staff

	Physics			Chemistry			Math's		
	MH	H	NH	MH	H	NH	MH	H	NH
Display of Current Periodicals	22(21.15)	49(47.12)	33(31.73)	21(19.09)	82(74.55)	7(6.36)	5(17.24)	1(51.72)	9(31.04)
Arrangement of Back Files of Periodicals	31(29.81)	39(37.50)	34(32.69)	34(30.91)	65(59.09)	11(10.00)	7(24.14)	15(51.72)	7(24.14)
Behavior of Library Staff	27(25.96)	53(50.96)	24(23.08)	25(22.73)	63(57.27)	22(20.00)	7(24.14)	16(55.17)	6(20.69)

MH Most Helpful, H Helpful, NH Not Helpful

Display of current periodicals has been indicated as 'most helpful' by 21.15% respondents in physics, 19.09% in chemistry and 17.24% in math's, whereas, 47.12%, 74.55% and 51.72% in math's and 37.50% in physics have indicated arrangement of back files of periodicals on the shelves as 'helpful' and comparatively less percentage of respondents i.e. 30.91% in chemistry 29.81% in physics and 24.14% in math's have found it as 'most helpful'. Attitude of library staff has been indicated as 'most helpful' by 25.96% respondents in physics, 24.14% in math's and 22.73% in chemistry, whereas, 57.27% respondents in chemistry, 50.96% in physics and 55.17% in math's have indicated it as 'helpful'.

Thus, the overall comparison reveals that more percentage of respondents in chemistry, and math's have found the display of current periodicals as 'helpful' as compared with those in physics who find it as, 'most helpful'. Arrangement of back files of periodicals and the attitude of library staff have been found to be 'helpful' by most of the respondents in all the three subjects.

Competency of library staff to provide library services also affects the use of periodicals. Scientists opinion in all the three subjects has been analysed and presented in the following table.

TABLE 4BD.33: Respondents Opinion on Competence of Library Staff in Meeting Their Information Needs

Competency of Library staff	Physics			Chemistry			Maths		
	MC	C	NC	MC	C	NC	MC	C	NC
Competency of Library Staff	29(27.88)	58(55.77)	17(16.35)	38(34.55)	62(56.36)	10(9.09)	8(27.5)	16(55.17)	5(17.24)

MC Most Competent, C Competent, NC Not Competent

The highest percentage of scientists, who have found the library staff is 'competent' to give services relating to their information needs, is in chemistry i.e. 34.55% followed by math's i.e. 27.59% and physics 27.88% whereas, 56.36% respondents in chemistry, 55.77% in physics and 55.17% in math's feel that staff is competent.

TABLE 4BD.34: Respondents Opinion on About Usefulness of Periodical Collection

	Physics			Chemistry			Maths		
	MU	U	NU	MU	U	NU	MU	U	NU
efulness of iodicals	20 (19.23)	66 (63.46)	18 (17.31)	27 (24.55)	72 (65.45)	11 (10.00)	7 (24.14)	18 (62.07)	4 (13.79)

MU Most Useful, U Useful, NU Not Useful

Competency of library staff to provide library services also affects the use of periodicals. Scientists opinion in all the three subjects has been analysed and presented in the following table.

TABLE 4BD.33: Respondents Opinion on Competence of Library Staff in Meeting Their Information Needs

Competency of Library staff	Physics			Chemistry			Maths		
	MC	C	NC	MC	C	NC	MC	C	NC
Competency of Library Staff	29(27.88)	58(55.77)	17(16.35)	38(34.55)	62(56.36)	10(9.09)	8(27.5)	16(55.17)	5(17.24)

MC Most Competent, C Competent, NC Not Competent

The highest percentage of scientists, who have found the library staff is 'competent' to give services relating to their information needs, is in chemistry i.e. 34.55% followed by math's i.e. 27.59% and physics 27.88% whereas, 56.36% respondents in chemistry, 55.77% in physics and 55.17% in math's feel that staff is competent.

TABLE 4BD.34: Respondents Opinion on About Usefulness of Periodical Collection

	Physics			Chemistry			Maths		
	MU	U	NU	MU	U	NU	MU	U	NU
Usefulness of Periodicals	20 (19.23)	66 (63.46)	18 (17.31)	27 (24.55)	72 (65.45)	11 (10.00)	7 (24.14)	18 (62.07)	4 (13.79)

MU Most Useful, U Useful, NU Not Useful

The periodical collection has been found most usefulness only 24.55% scientists in chemistry, 24.14% in math's and 19.23% in physics, whereas, 65.45% in chemistry, 63.46% in physics and 62.07% math's have stated it as 'useful'. However, less than 18% respondents have indicated that periodical collection in their respective subject is 'not useful'.

PART C

ANALYSIS ON THE BASIS OF INDICATORS OF USE

C1 INTRODUCTION

This part of 'analysis' examines the use of periodicals on different indicators viz. Citations, in-library use, photocopy use, inter library loan use, and assessed use. The details with regard to method of data collection on use, source material used, size of sample, time period selected for data collection have already been discussed in the chapter 3 dealing with Research design and Methodology. Initially, data on use was collected on each indicator separately and ranks were computed on the basis of frequency of use of periodicals in both university libraries in each of three subjects separately, but later, as stated in the next section, no relation could be established between them therefore, all indicators were taken together for study.

C2 RELATIONSHIP OF INDICATORS USED

On comparing, variance in 'ranks' obtained by periodicals through different indicators it had been observed that it would be incorrect to conclude the use pattern on the basis of each indicator separately. Further, to know the relationship, if any, between and two indicators Pearson Correlation Coefficient(r) test using the formula was computed with the help of computer, by making pairs of indicators on use data of the CSL (DU) taken as a sample in all the three subjects.

$$R = \frac{N \sum xy - (\sum x)(\sum y)}{[N \sum x^2 - \sum x^2] [N \sum y^2 - \sum y^2]}$$

TABLE 4C.1: Value of co-efficient of Correlation 'r' for Different Pairs of Indicators in Physics, Chemistry and Math's

S. No.	Pair of Indicators	Physics	Chemistry	Maths
1.	IU-CU	0.3901	0.4569	0.3013
2.	IU-PU	0.5826	0.7826	0.5836
3.	IU-LU	-0.0504	0.0185	0.1440
4.	IU-AU	0.2860	0.4073	0.4030
5.	CU-PU	0.3660	0.5727	0.3842
6.	CU-LU	-0.0473	0.1373	0.1760
7.	CU-AU	0.5632	0.6752	0.3411
8.	PU-LU	-0.0457	0.0820	0.1734
9.	PU-AU	0.4423	0.4475	0.3502
10.	LU-AU	-0.0223	0.0360	0.0575

IU – In Library Use; CU – Citation Use; PU – Photocopy Use; LU – Inter Library Loan Use; AU – Assessed Use

The analysis of data reveals that value of 'r' in all pairs of indicators and in all the three subjects is neither '+1' nor '-1'. It can, therefore, be said that no pair of indicator is perfectly related either positively or negatively. However, the relationship of photocopy use with 'in library use' is comparatively better for the value of 'r' being 0.5826 In physics, 0.7826 in chemistry, and 0.5836 In math's. In Chemistry again relationship of citation use with photocopy use and Assessed Use is comparatively better for the value of 'r' is '0.5727' and '0.6752'. In Physics relationship of Inter Library Loan Use with all other indicators i.e. In Library Use, Citation Use, Photocopy Use and Assessed Use is negative which shows that no relationship exists between the indicators or one can say that scientists in physics do not borrow

periodicals on ILL. In math's the relationship of all pairs except 'In Library Use' and Photocopy Use is below the value of '0.5', thus could be considered as insignificant.

It can, therefore, be concluded that there is no perfect relationship in between use data of the selected indicators. It had, therefore, been decided to analyse the data on the basis of total use (i.e. the sum of uses acquired by a periodical on all the indicators). Rank lists have been compiled on the basis of total use along with their percentage contribution to use. Rank lists so prepared on the total use for Physics, Chemistry and Maths in both university libraries are appended at appendix respectively.

C3 MOST FREQUENTLY USED PERIODICALS

To identify most frequently used periodicals data has been analysed on the basis of number of uses made of periodical.

C3.1 PHYSICS

The following table gives the number of periodicals supplying percentage uses on the basis of their frequency of use in Physics. The analysis presented in this Table as well as other Table under this section based on the frequency of use of periodicals given for both university libraries at Appendix

TABLE 4C.2: Use Frequency of Periodicals in Physics and their percentage contribution to use in both university libraries under study

Frequency of Use	CSL(DU)		JNU	
	1	2	1	2
1	2	3	4	5
101 and above	1	6.6	1	13.5

	0.7		1.6	
51 and above	10	31.3	3	30.1
	6.8		4.8	
26 and above	36	64.8	10	55.1
	24.5		16.1	
11 and above	73	86.7	32	90.3
	49.6		51.6	
6 and above	108	96.2	38	95.2
	73.5		61.3	
1 and above	147	100	62	100
	100		100	

1Number of Periodicals/Percentage of Periodicals; 2PercentageContribution to Use

The analysis reveals that only 2 periodicals are most frequently used periodicals chemistry with a frequency of 101 and above in CSL (DU); i.e. 5 periodicals in JNU, the highest percentage of periodicals contributing to 26 and above frequency of uses is from. In CSL (DU) and JNU 16.8% i.e. 25 periodicals and 7.6% i.e. 7 periodicals with a frequency of 26 and above are contributing to 63.5% and 40.9% use respectively. In supplying 11 and above uses maximum percentage of used periodicals is CSL (DU) with 32.9% and JNU with 27.2% supplying 82.9% 80.9% 81% and 74.3% uses respectively.

Assuming periodicals having 26 and above frequency of use as most frequently used periodicals the absolute number of periodicals is highest in i.e. 27 followed by CSL (DU) JNU i.e. 7. Thus 16.8% periodicals in chemistry

in CSL (DU); in JNU i.e. 27 followed by CSL (DU) i.e. 7 Thus 16.8% periodicals in chemistry in CSL (DU); in JNU .

C3.3 CHEMISTRY

The following Table gives data on Chemistry periodicals on the basis of their frequency of use.

TABLE 4C.3: Use Frequency of Periodicals in Chemistry and their percentage contribution to use in both university libraries under study

Frequency of Use	CSL(DU)		JNU	
	1	2	1	2
1	2	3	4	5
101 and above	2	14.6	Nil	Nil
	1.3			
51 and above	9	36.7	5	34.5
	6.0		5.4	
26 and above	25	63.5	7	40.9
	16.8		7.6	
11 and above	49	81.0	25	74.3
	32.9		27.2	
6 and above	79	91.8	43	89.4
	53.0		46.7	
1 and above	149	100	92	100
	100		100	

1 Number of Periodicals/Percentage of Periodicals; 2 Percentage Contribution to Use

The analysis of data reveals that 101 frequency of uses are supplied by 4 i.e. 1.9% periodicals in 0.7% in CSL (DU) and i.e. 1.9% periodicals in 0.7% in CSL (DU) and i.e. 1.6% in JNU which contribute 21.2% 6.6% and 13.6% respectively to total use. The highest number of periodicals having 51 and above frequency of use is from CSL (DU) with 10 periodicals i.e. 6.8% followed by followed by in JNU with 3 i.e. 4.85 contribute respectively to total uses. In the category of 26 and above frequency of use highest number of periodicals again is from CSL (DU) with 36 i.e. 24.5% in JNU 10 i.e. 16.1% and contribution total use. In the category of 11 and above frequency of use CSL (DU) tops with 73 periodicals i.e. 49.6% followed by in JNU 32 periodicals i.e. 51.6% with their respective contribution of 90.3% to total use.

Assuming 26 and above frequency of use as most frequently used periodicals it can be concluded that the highest number of most frequently used titles are from CSL (DUI) followed findings list of periodical titles have been given in Appendix.

C3.3 MATHS

In Math 101 and above frequency of uses are supplied by 4 i.e. 1.4% periodicals i.e. 1.4% periodicals i.e. 1.2% in CSL (DU) , and i.e. 0.9% in JNU contributing to 8.9% , 9.10% use respectively. The highest number of periodicals supplying 51 and above frequency of use is followed by 12 7.2% in CSL (DU), 2

TABLE 4C.4: Use Frequency of Periodicals in Math's and their percentage contribution to use in both university libraries under study

Frequency of Use	CSL(DU)		JNU	
	1	2	1	2
1	2	3	4	5
101 and above	2	8.9	1	9.10
	1.2		0.9	
51 and above	12	35.2	2	14.0
	7.2		1.8	
26 and above	29	58.2	18	53.0
	17.4		15.9	
11 and above	67	84.5	44	84.2
	40.1		38.9	
6 and above	96	93.1	58	91.9
	57.5		51.3	
1 and above	167	100.00	113	100.00
	100.00		100.00	

1 Number of Periodicals/Percentage of Periodicals; 2 Percentage Contribution to Use

i.e. 1.8% periodicals in JNU and periodicals with 26 and above frequency of uses is the highest in i.e. 14.1% followed by CSL (DU) 29-i.e.

17.4%, JNU 18 i.e. 8.1% which contribute to 54.6%, 58.2%, 53%, 50.5% and 32% of total use respectively. Periodicals having frequency of 11 and above use are again highest i.e. 38.95 38 periodicals with their contribution to use respectively.

Assuming periodicals having 26 and above frequency of use are as most frequently used periodicals it can be concluded that first rank followed by CSL (DU), used periodicals contributing to and 325 uses. List and titles of used periodicals has been given in Appendix

C4 SCIENTIST NEEDS FOR PERIODICALS Vs PERCENTAGE FREQUENCY OF CUMULATIVE USE

With a view to find out the number of periodicals in different subjects meeting the information needs of scientists, in both university libraries the data has been analysed on the basis of percentage cumulative use of periodicals and presented in the following tables for Physics, Chemistry and Math's separately. Titles of periodicals along with their percentage contribution and cumulative percentage contribution are listed in Appendices

C4.1 PHYSICS

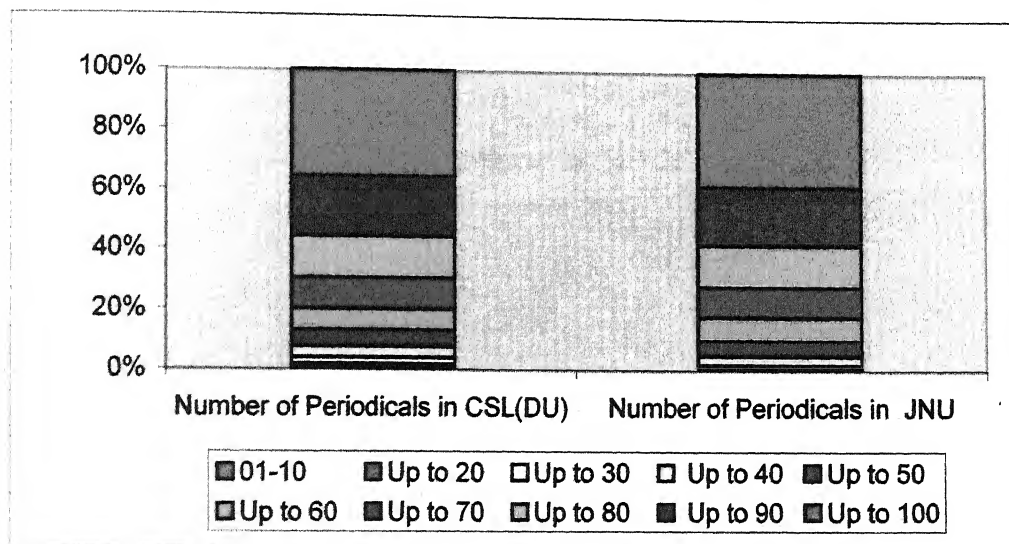
In Physics, the analysis, reveals that 90% needs of scientists in CSL (DU) are met by 82 (55.7%) periodicals, in JNU with 31(50.1%) periodicals as against periodicals respectively needed to meet 100% needs of scientists.

TABLE 4C.5: Number of Periodicals Needed to Meet Scientists Information Needs According to Frequency of Cumulative Use in both university libraries in Physics

% Frequency of Cumulative Use	Number of Periodicals in	
	CSL(DU)	JNU
1	2	3
01-10	3(1.4)	Nil
Up to 20	5(3.4)	1(1.60)
Up to 30	9(6.1)	2(3.2)
Up to 40	15(10.2)	5(8.0)
Up to 50	22(15.00)	8(12.9)
Up to 60	30(20.4)	12(21.01)
Up to 70	42(28.6)	16(25.8)
Up to 80	58(39.5)	23(37.0)
Up to 90	82(55.7)	31(50.00)
Up to 100	147(100.00)	62(100.00)

However, to meet 50% information needs of physicists, the number of periodicals needed by scientists i.e. 115 followed by 22 i.e. 15% CSL (DU) 8 i.e. 12.9% in JNU. To satisfy 20% needs of scientists periodicals each are needed by CSL (DU), periodical is needed by JNU which ranges between 1.4% and 5% periodicals in different libraries.

CHART SHOWING NO. OF PERIODICALS NEEDED TO MEET 90% INFORMATION NEEDS OF THE SCIENTISTS IN PHYSICS



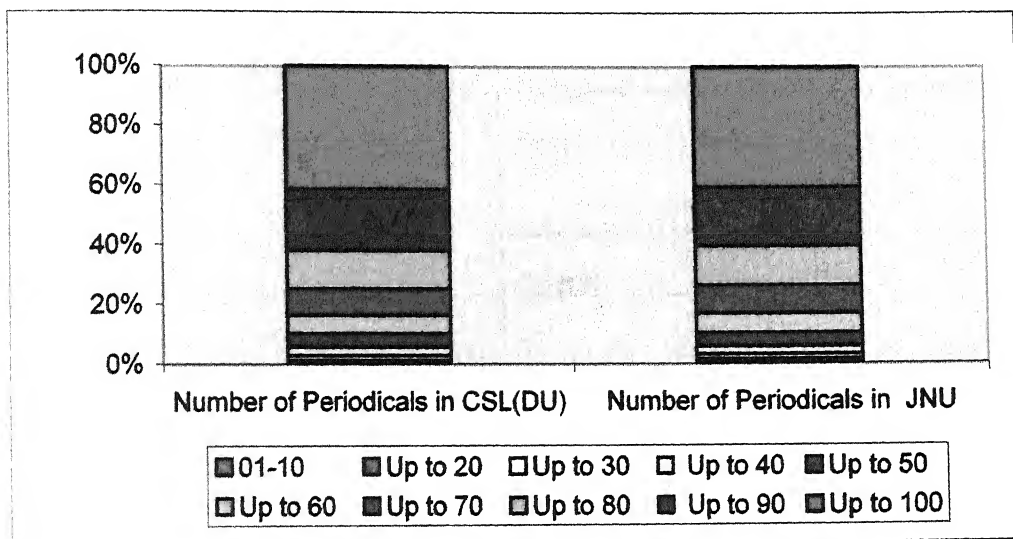
C4.2 CHEMISTRY

The analysis reveals that in chemistry 90% information needs of are being met by 72 (49%) periodicals in CSL (DU), 4 (47.8%) in JNU 92%, 81 periodicals respectively needed to meet 100% information needs of scientists.

TABLE 4C.6: Number of Periodicals Needed to Meet Scientists Information Needs According to Percentage Frequency of Cumulative Use in Chemistry in both university libraries

% Frequency of Cumulative Use	Number of Periodicals in	
	CSL(DU)	JNU
1	2	3
01-10	1(0.7)	1(1.1)
Up to 20	3(2.0)	2(2.2)
Up to 30	6(4.1)	4(4.3)
Up to 40	10(6.8)	6(6.5)
Up to 50	16(10.7)	10(10.9)
Up to 60	22(15.0)	15(16.3)
Up to 70	31(21.1)	21(22.8)
Up to 80	46(31.3)	30(32.6)
Up to 90	72(49.0)	44(47.8)
Up to 100	149(100.00)	92(100.00)

CHART SHOWING NO. OF PERIODICALS NEEDED TO MEET 90% INFORMATION NEEDS OF THE SCIENTISTS IN CHEMISTRY



However, 50% needs of scientists can be met only by 16 (10.7%) periodicals in CSL (DU), and in 10 (10.9%) in JNU. 3 in CSL (DU), and 2 in JNU are needed to meet 205 needs of scientist in chemistry which ranges between 2.1% and 4.9% of the periodicals In different libraries.

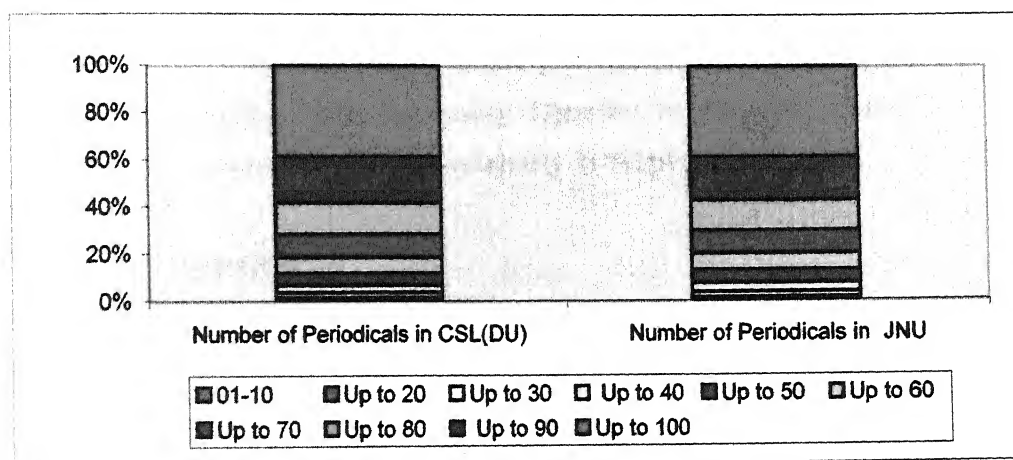
C4.3 MATHS

The analysis reveals that in Math's 90% needs of scientists are met by 147 i.e. 83 i.e. 49.7% in CSL (DU), 53 i.e., 46.9% in JNU, 167, 111, 113 and 75 periodicals respectively are needed to meet 100% information needs of scientists.

TABLE 4C.7: Number of Periodicals Needed to Meet Scientists Information Needs According to Frequency of Cumulative Use in both university libraries in Math's

% Frequency of Cumulative Use	Number of Periodicals in	
	CSL(DU)	JNU
1	2	3
01-10	2(1.1)	1(0.8)
Up to 20	5(2.9)	3(2.6)
Up to 30	9(5.3)	7(6.1)
Up to 40	14(8.3)	11(9.7)
Up to 50	21(12.50)	16(14.1)
Up to 60	30(17.9)	21(18.5)
Up to 70	42(25.1)	28(24.7)
Up to 80	58(34.7)	38(33.6)
Up to 90	83(49.7)	53(46.9)
Up to 100	167(100.00)	113(100.00)

CHART SHOWING NO. OF PERIODICALS NEEDED TO MEET 90% INFORMATION NEEDS OF THE SCIENTISTS IN MATHS



However for 50% needs of scientists number of periodicals needed in CSL (DU), 16 in JNU which forms 11.6%, 12.5%, 14.1% and 18.6% respectively. To satisfy 20% needs of mathematization, whereas CSL (DU) needs 3 periodicals which ranges between 2.6% and 5.3% in different libraries.

It can, therefore, be concluded that to meet 90% information needs of scientists in both university libraries in Delhi. In chemistry 47.8% to 53.8% used periodicals are needed whereas in physics 49.7% to 59% used periodicals and in Math's 46.9% to 58.6% periodicals are needed. It shows that use pattern in chemistry, physics and Math is same in both university libraries in Delhi.

C5 USE Vs SELF SUFFICIENCY OF PERIODICALS

The following three tables give number of periodicals used by scientists in selected both university libraries in Physics, Chemistry and Math's in comparison with their availability in respective libraries.

C5.1 PHYSICS

NPL occupies highest rank in self sufficiency by having 172 i.e. 82.30% periodicals used by scientists followed by with 42%, JNU with 23 i.e. 37.10% and CSL (DU) with 50% i.e. 34.01 periodicals.

TABLE 4C.8: Self-sufficiency Rate of Periodicals in Physics in both University Libraries

Libraries	Total No. of Periodicals Used	No. of Periodicals Available	No. of Periodicals Not Available
CSL(DU)	147(100.00)	50(34.01)	97(65.99)
JNU	62(100.00)	23(37.10)	39(62.90)

However, for 97 i.e. 65.99% periodicals in CSL (DU), 30 i.e. 62.90% in JNU, depend on other libraries. It can, therefore, be concluded that self sufficiency rate in physical sciences ranging between 34.01% in CSL (DU)

C5.2 CHEMISTRY

In CSL (DU) out of 149 periodicals being used by scientists only 75% i.e. 50.3% titles are available for use and for rest of 74 i.e. 49.7% periodicals scientists

TABLE 4C.9: Self-sufficiency Rate of Periodicals in Chemistry in both University Libraries

Libraries	Total No. of Periodicals Used	No. of Periodicals Available	No. of Periodicals Not Available
CSL(DU)	149(100.00)	75(50.3)	74(49.7)
JNU	92(100.00)	43(46.74)	49(74.19)

have to depend on other libraries. Out of 139 periodicals which are being used by scientists, 71% i.e. 51% are available in library, whereas, for 68 i.e. 49% periodicals scientists have to depend on other libraries. Periodicals are 46.74% i.e. 43, and 65.4% i.e. respectively, whereas for 69 i.e. 74.19% and i.e. 34.57% periodical scientists have to depend on other libraries.

It can therefore be concluded that 50% more needs of CSL (DU) scientists in the field of chemistry are met by their respective libraries whereas, scientists of JNU dependent on other libraries for more 50% of their needs for periodicals.

C5. 3 MATHS

In Math's total number of periodicals used by to depend on other libraries. In CSL (DU) number of periodicals used is 167 and 107 i.e. 64.07% are available in the library and for remaining 35.93% periodicals scientists are dependent on other libraries.

TABLE 4C.10: Self-sufficiency Rate of Periodicals in Maths in both University Libraries

Libraries	Total No. of Periodicals Used	No. of Periodicals Available	No. of Periodicals Not Available
CSL(DU)	167(100.00)	107(64.07)	60(35.93)
JNU	113(100.00)	96(84.96)	17(15.04)

In scientists are dependent on other libraries. In JNU; periodicals are used by scientists and out of these 96 i.e. 84.96%, 60 i.e. 54.05% and 57 i.e. 76% respectively periodicals are available in their respective 17% i.e. 15.04% in JNU scientists in Maths have to depend on other libraries.

It can, thus be concluded that the self-sufficiency rate in periodicals used in Physics, Chemistry and Maths is at variance. Whereas, in physics it varies between 34.01% in CSL (DU) and in maths varies between 34.01% in CSI (DU) and Maths Further, self sufficiency rate in Maths is highest followed by chemistry and physics.

C6 USE Vs CURRENT PERIODICALS RECEIVED

Data has been collected, tabulated and analysed in the following few tables with a view identify use of current periodicals received in selected both University Libraries. The periodicals included in the use survey has been

assumed to be the periodicals received in the library in each subject for the purpose of analysis in these sections.

C6.1 PHYSICS

In physics , number of periodicals received is highest in 42% CSL (DU) with 95.12% i.e.15, Thus it can be said that maximum percentage of unused periodicals is 52.38% and minimum from CSL (DU)

TABLE 4C.11: Use of Periodicals in Physics Received during 2004-05 in selected both University Libraries

Libraries	Periodicals Studied	Periodicals Used	Periodicals Not Used
CSL(DU)	41(100.00)	39(95.12)	2(4.83)
JNU	19(100.00)	15(79.95)	4(21.05)

C6.2 CHEMISTRY

In chemistry during the year 2004-05 the number of periodicals studied for use survey is 51 in CSL(DU) and 43 in JNU From these maximum percentage of used periodicals come from 39 i.e. 76.74% in CSL (DU) 38 i.e. 38.37% Periodicals in JNU. The analysis shows that the maximum percentage of unused periodicals comes i.e. 42.39% followed by CSL (DU) 23.53% and JNU 11.63%.

TABLE 4C.12: Use of Periodicals in Chemistry Received during 2004 -05 in selected both University Libraries

Libraries	Periodicals Studied	Periodicals Used	Periodicals Not Used
CSL(DU)	51(100.00)	39(76.47)	12(23.53)
JNU	43(100.00)	38(38.37)	5(11.63)

C6.3 MATHS

In Math's from current periodicals maximum percentage of used periodicals followed by CSL (DU) with 70.47%. Thus highest number of unused CSL (DU) 25.93% and JNU 22.86%.

TABLE 4C.13: Use of Periodicals in Math's Received during 2004-05 in selected both University Libraries

Libraries	Periodicals Studied	Periodicals Used	Periodicals Not Used
CSL(DU)	54(100.00)	40(74.04)	14(25.93)
JNU	70(100.00)	54(77.14)	16(22.86)

It can be conducted that in chemistry percentage use of received periodicals ranges between 38.37% in JNU and whereas in physics it ranges between 38.37% in JNU and whereas in physics it ranges between in CSL (DU), and in Math's and 77.145 in JNU. Thus it can be said that among selected both university libraries the acquisition of periodicals in chemistry in physics in CSI (DU) and in Math's in JNU is most relevant to the need of scientists.

C7 USE Vs COUNTRY OF ORIGIN

The comparative data on use of periodicals has been computed according to the country of origin of periodicals.

TABLE 4C.14: Use of Periodicals in Relation to Country of Publication

Country	Physics			Chemistry			Maths		
	No. of pdls Used	Total Use	% Use	No. of pdls Used	Total Use	% Use	No. of pdls Used	Total Use	% Use
India	63	869	9.00	38	786	10.04	112	2049	20.18
USA	164	4965	51.43	121	2551	32.59	139	2934	28.89
UK	94	1857	19.23	80	2350	30.02	89	1927	18.98
Netherlands	38	790	8.18	29	522	6.67	41	918	9.04
Japan	9	344	3.56	11	183	2.34	17	372	3.66
Switzerland	8	138	1.43	10	380	4.86	8	100	0.98
Germany	12	251	2.60	18	216	2.76	24	272	2.68
Others	47	441	4.57	89	839	10.72	79	1583	15.59
Total	435	9655	100	366	7827	100	509	10155	100

The analysis reveals that in chemistry, USA occupies first rank with 32.59% use from 121 periodicals followed by UK, India, Netherlands, Switzerland, Germany, and Japan by contributing 30.02% use from 80 periodicals, 10.04% use from 18 periodicals and 2.34% use from 11 periodicals and 2.34% use from 11 periodicals 2.76% use from 18 periodicals and 2.344 use from 11 periodicals respectively . The contribution of other countries is 10.72% use from 59 periodicals.

In physics also USA occupies first rank by contributing 51.43% use through 164 periodicals. Second position in physics is acquired by UK with 19.23% contribution from 94 periodicals and 2.34% use from 11 periodicals respectively. The contribution of other countries is 10.72% use from 59 periodicals.

CHART SHOWING THE USE OF PERIODICLS Vs COUNTRY OF ORIGIN (PHYSICS & CHEMISTRY)

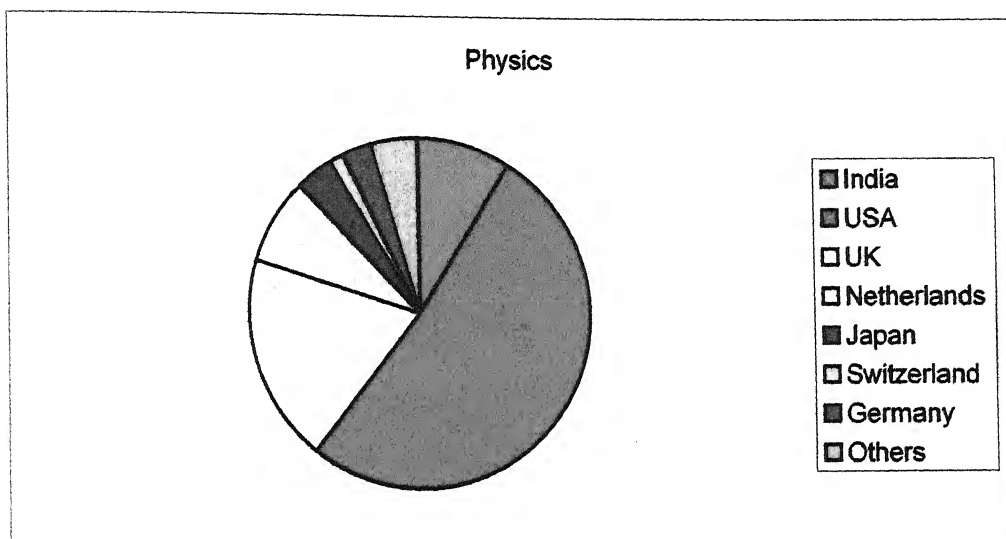


Figure of percentage should be mentioned.

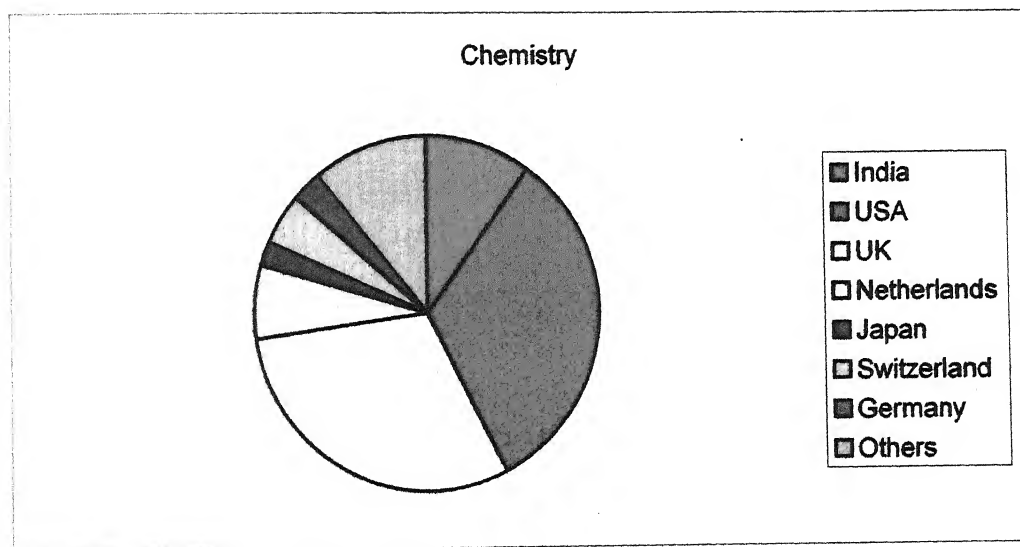
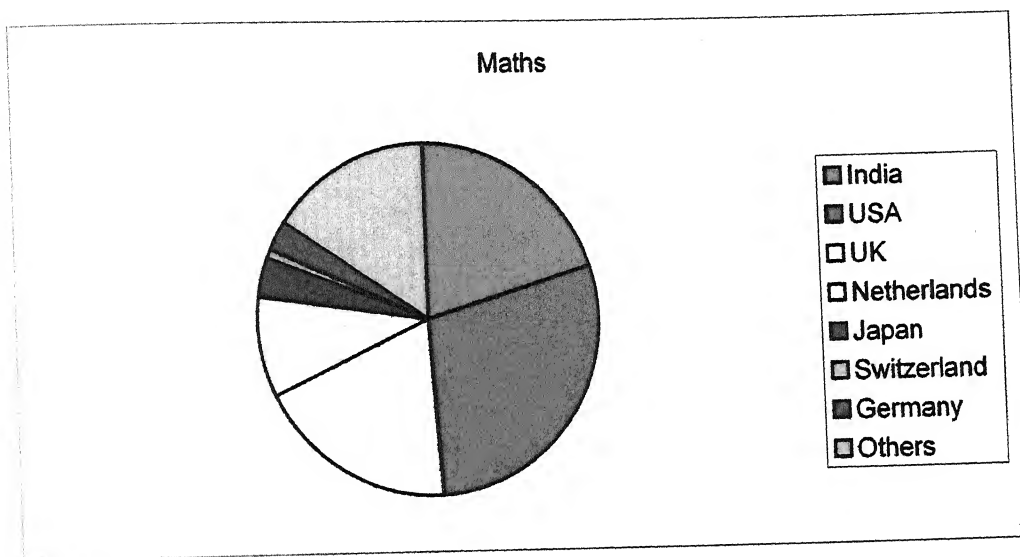


CHART SHOWING THE USE OF PERIODICALS Vs COUNTRY OF ORIGIN (MATHS)



In physics also USA occupies first rank by contributing 51.43% use through 164 periodicals. Second position in Physics is acquired by UK... With 19.23% contribution from 94 periodicals, 3.56% contribution from 9 periodicals 8.18% contribution from 38 periodicals. Contribution from 2.60 contribution from 12 periodicals, from 8 periodicals and 1.43% contribution from 8 periodicals . Rest of the countries of world are contributing 4.57% use from 47 periodicals.

In Math's again USA occupies first rank by contributing 28.18% use from 112 periodicals and UK third rank with 18.98% contribution from 89 periodicals. Next in rank are Netherlands, Japan, Germany, and Switzerland with 9.04%, 3.66%, 2.68% and 0.98% contribution to use from 41,17 ,24 and a periodicals respectively.

It can, therefore, be concluded that taking into account the concentration of use of periodicals on the basis periodicals published from U.S.A, U.K. India and Netherlands to the extent of 87.84% from 359 periodicals in Physics, 79.32% from 268 periodicals in Math's. Another important interference from the analysis of data in the use of periodicals is that the use is most concentrated in chemistry (366 periodicals), and it is most scatted whereas in Math's (with 509 periodicals). However, in physics the use (435 ranges between the two extremes chemistry and Math's as far as the three subjects under study are concerned.

C8 USE Vs AGE OF PERIODICALS

The data on year wise use has also been analysed to identify half life and point of obsolescence of periodicals in Physics, Chemistry and Math's. Following three tables show distribution of use according to the year of publication and their percentage contribution to use.

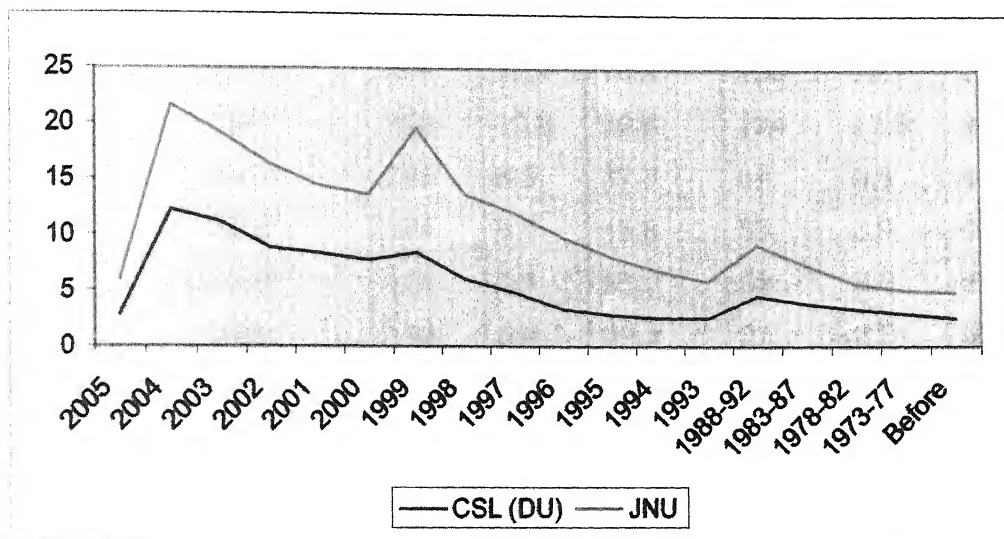
C8.1 PHYSICS

TABLE 4C.15: Use of Periodicals in Physics in relation to their age

Age of Periodical	Year	CSL(DU)			JNU		
		U	%U	C%U	U	%U	C%U
1 Year	2005	84	2.9	2.9	32	3.1	3.1
	2004	359	12.3	15.2	98	9.4	12.5
2 Year	2003	325	11.2	26.4	84	8.0	20.5
3 Year	2002	259	8.9	35.3	78	7.5	28.0
4 Year	2001	244	8.4	43.7	64	6.1	34.1
5 Year	2000	227	7.8	51.5	62	5.9	40.0
6 Year	1999	250	8.5	60.0	116	11.2	51.2
7 Year	1998	179	6.1	66.1	80	7.6	58.8
8 Year	1997	142	4.9	71.0	75	7.2	66.0
9 Year	1996	98	3.4	74.4	68	6.5	72.5
10 Year	1995	84	2.9	77.3	54	5.2	77.5
11 Year	1994	76	2.6	79.9	44	4.2	81.9
12 Year	1993	75	2.6	82.5	34	3.3	85.2
17 Year	1988-92	135	4.6	87.1	48	4.6	89.8
22 Year	1983-87	113	3.9	91.0	36	3.5	93.3
27 Year	1978-82	100	3.4	94.4	24	2.3	95.6
32 Year	1973-77	88	3.0	97.4	22	2.1	97.7
Above 32 Years	Before	76	2.6	100.00	24	2.3	100.00
	Total	2914	100		1043	100	

The analysis reveals that little above 50% use of periodicals in physics is from periodicals published during last five years in CSL (DU) and JNU is contributed by periodicals published with in last five years.

CHART SHOWING THE HALF LIFE AND OBSOLESENECE OF PERIODICLS IN PHYSICS



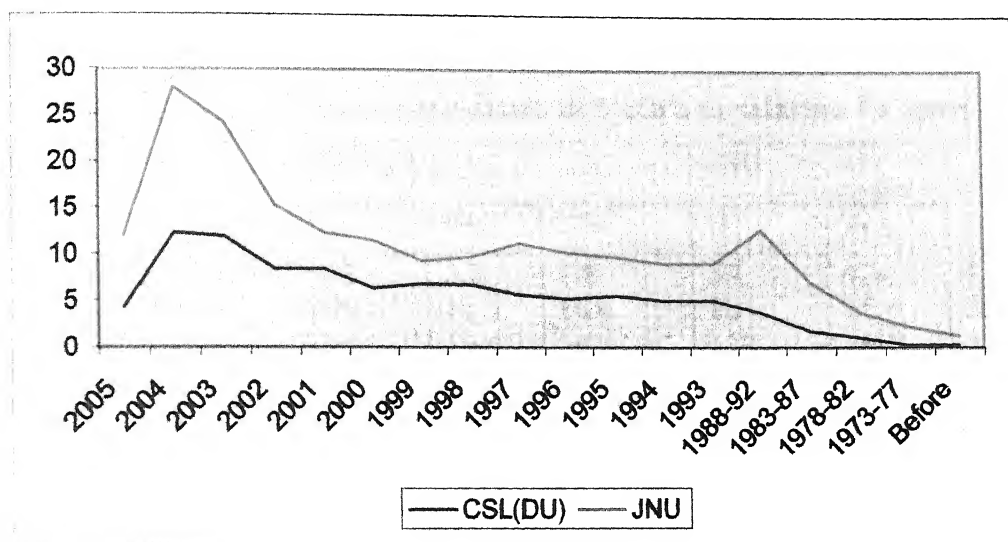
It can therefore, be said that half life (50% use) of physics periodicals in CSL (DU) and JNU is 5 years and 6 years respectively. The point of adolescence (85%) in periodicals in Physics is 17 years in CSL(DU), 27 years in JNU.

C8.2 CHEMISTRY

TABLE 4C.16: Use of Periodicals in Chemistry in relation to their age

Age of Periodical	Year	CSL(DU)			JNU		
		U	%U	C%U	U	%U	C%U
	2005	96	4.4	4.4	77	7.7	7.7
1 Year	2004	269	12.4	16.8	158	15.7	23.4
2 Year	2003	259	12.0	28.8	124	12.3	35.7
3 Year	2002	183	8.5	37.3	69	6.9	42.6
4 Year	2001	184	8.5	45.8	39	3.9	46.5
5 Year	2000	138	6.4	52.2	52	5.2	51.7
6 Year	1999	149	6.9	59.1	25	2.5	54.2
7 Year	1998	147	6.8	65.9	30	3.0	57.2
8 Year	1997	124	5.7	71.6	56	5.6	62.8
9 Year	1996	115	5.3	76.9	50	5.0	67.8
10 Year	1995	122	5.6	82.5	42	4.2	72.0
11 Year	1994	110	5.1	87.6	40	4.0	76.0
12 Year	1993	109	5.1	92.7	41	4.0	80.0
17 Year	1988-92	82	3.8	96.5	90	9.0	89.0
22 Year	1983-87	39	1.8	98.3	53	5.3	94.3
27 Year	1978-82	24	1.1	99.4	27	2.7	97.0
32 Year	1973-77	6	0.3	99.7	21	2.0	99.0
Above 32 Years	Before	5	0.3	100.00	11	1.0	100.00
	Total	2161	100		1005	100	

CHART SHOWING THE HALF LIFE AND OBSOLESCENCE OF PERIODICLS IN CHEMISTRY



The analysis reveals that little above 50% use in periodicals in chemistry in CSL (DU) and JNU is contributed by periodicals in chemistry in CSL (DU) and JNU is contributed by periodicals published with in last five years.

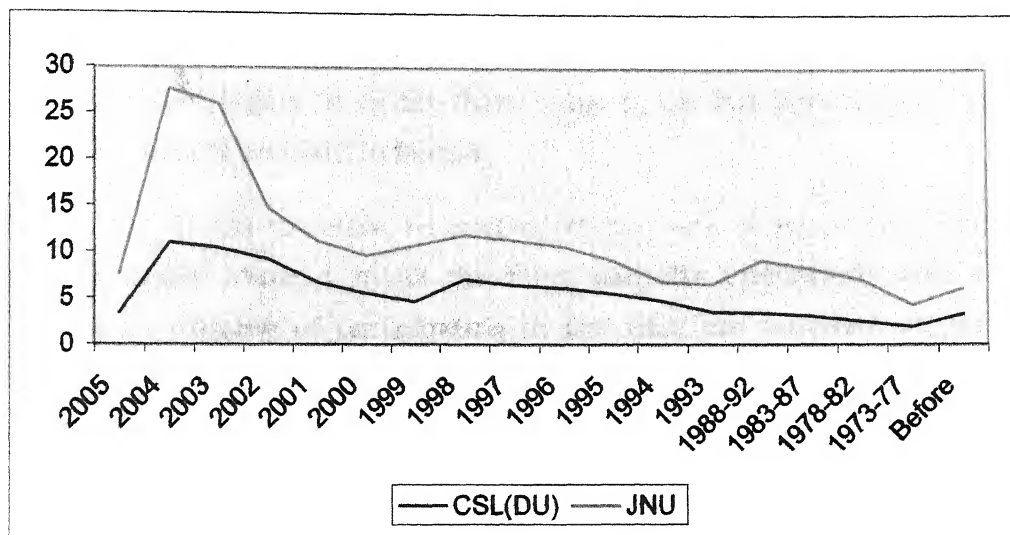
It can therefore be said that the half life (50%) use of chemistry periodicals in CSL (DU), JNU is 5 years considering strain findings the obsolescence occurs at 15% or less of all use, it has been found that the adolescence occurs at 15% or less of all use, it has been found that the obsolescence in periodicals in chemistry in CSL (DU).

C8.3 MATHS

TABLE 4C.17: Use of Periodicals in Math's in relation to their age

Age of Periodical	Year	CSL(DU)			JNU		
		U	%U	C%U	U	%U	C%U
1 Year	2005	91	3.5	3.5	59	4.2	4.2
2 Year	2004	291	11.1	14.6	234	16.6	20.8
3 Year	2003	276	10.5	25.1	219	15.6	36.4
4 Year	2002	244	9.3	34.4	78	5.5	41.9
5 Year	2001	178	6.8	41.2	70	4.5	46.4
6 Year	2000	147	5.6	46.8	58	4.1	50.5
7 Year	1999	123	4.7	51.5	185	6.1	56.6
8 Year	1998	186	7.1	58.6	68	4.8	61.4
9 Year	1997	170	6.5	65.1	64	4.9	66.3
10 Year	1996	164	6.2	71.3	59	4.5	70.8
11 Year	1995	148	5.6	76.9	50	3.6	74.4
12 Year	1994	125	4.8	81.7	30	2.1	76.5
17 Year	1993	94	3.6	85.3	43	3.0	79.5
22 Year	1988-92	91	3.5	88.8	80	5.7	85.2
27 Year	1983-87	84	3.2	92.0	72	5.1	90.3
32 Year	1978-82	67	2.6	94.6	63	4.5	94.8
Above 32 Years	1973-77	52	2.0	96.6	34	2.4	97.2
	Before	89	3.4	100.00	40	2.8	100.00
	Total	2620	100		1406	100	

CHART SHOWING THE HALF LIFE AND OBSOLESCENCE OF PERIODICALS IN MATHS



C9 RANK LIST OF PERIODICALS IN PHYSICS, CHEMISTRY AND MATHS

Rank list of periodicals based on total use in different libraries has been given in Appendices 3 to 10. Appendices 1 to 2 Give the rank list of periodicals in Physics in both university libraries, 3 to 4 in Chemistry and 5 to 6 in Math's. Comparing the rank of first 10 periodicals in both university libraries it has been found that ranks based on total use of periodicals differ from library to library. Further, the comparative rank lists of periodicals in both university libraries (Appendices 7 to 9) reveals that there are only 7 Periodicals in Physics, 8 in Chemistry and 16 in Math's which are commonly used by scientists in all the libraries. Further, 51 periodicals in Physics, 28 in Chemistry and 38 in Math's are used by scientists in both university libraries under study however, 86 Periodicals in Physics, 65 Chemistry and 91 in Math's are commonly used by both university libraries. The number of periodicals used by scientists in one library is much higher in all the three subjects i.e. 208 Periodicals in Physics, 240 in Chemistry and 280 in Math's.

It can therefore, be concluded that rank of periodicals differs from both university libraries in all the three subjects under study and with the decrease in number of participating in libraries, the numbers of periodicals having common use creases and this pattern is similar in both university libraries.

C10 RESOURCE SHARING, REMOTE STORAGE AND DISCARD OF PERIODICALS

To identify periodicals which could be considered for remote storage, discard or cancellation, the data (from appendices 3 to 10) on low use frequency of periodicals has been analysed. The following Tables present use data of periodicals, which have acquired 1 to 10 frequencies of total use along with their cumulative percentage contribution to use. Based on the analysis the library can decide on resource sharing, remote storage, discard or cancellation of subscription to periodicals for low used subscription to

periodicals for low used periodicals. This would also help in deciding upon networking arrangements amongst both university libraries under study.

C10.1 PHYSICS

TABLE 4C.18: Number of Periodicals for Resource Sharing, Remote Storage, and Discard in Physics

Frequency of Use	CSL(DU)		JNU	
	Cum. No. of Pdl's	Cum. % of Total Use	Cum. No. of Pdl's	Cum. % of Total Use
1	8	0.2	11	1.1
2 and below	19	0.9	18	2.4
3 and below	27	8.9	19	2.6
4 and below	33	9.7	22	3.7
5 and below	39	10.7	24	4.6
6 and below	43	11.5	25	5.1
7 and below	53	13.9	25	5.1
8 and below	64	16.8	27	6.6
9 and below	68	18.0	28	7.4
10 and below	74	21.4	30	9.3

In physics 1 frequency pf use has been contributed by maximum number of periodicals o 1.8% in JNU 11 TO 1.1 %Use the analysis of data up to frequency of uses along with their contribution to the use reveals that the highest number of periodicals in where as 85 periodicals and 30 in JNU are contributing to 22.2 21.7% use respectively

C10.2 CHEMISTRY

TABLE 4C.19: Number of Periodicals for Resource Sharing, Remote Storage, and Discard in Chemistry

Frequency of Use	CSL(DU)		JNU	
	Cum. No. of Pdl's	Cum. % of Total Use	Cum. No. of Pdl's	Cum. % of Total Use
1	25	1.2	22	2.2
2 and below	39	2.4	35	4.8
3 and below	49	3.8	39	6.0
4 and below	60	5.8	43	7.6
5 and below	70	8.1	49	10.6
6 and below	77	10.0	50	11.2
7 and below	83	11.9	54	14.2
8 and below	89	14.1	57	16.4
9 and below	98	17.8	63	21.8
10 and below	100	18.7	67	25.8

The analysis reveals that, in chemistry1, use frequency has been acquired by 25 periodicals in CSL (DU) which contribute to 1.2% of total use, 22 periodicals contribute to 2.2% use in JNU, Analysing the data for periodicals contribute to 2.2% use in JNU, Analysing the data for periodicals supplying frequency of use upto 5 and their contribution to 18.7% 25.8 Respectively.

C10.3 MATHS

TABLE 4C.20: Number of Periodicals for Resource Sharing, Remote Storage, and Discard in Math's

Frequency of Use	CSL(DU)		JNU	
	Cum. No. of Pdl's	Cum. % of Total Use	Cum. No. of Pdl's	Cum. % of Total Use
1	19	0.7	26	1.8
2 and below	37	1.3	38	3.4
3 and below	56	3.3	47	5.2
4 and below	63	4.3	51	6.3
5 and below	71	5.8	55	7.7
6 and below	75	6.7	58	8.9
7 and below	83	8.8	63	11.4
8 and below	86	9.7	65	12.5
9 and below	94	12.4	66	13.1
10 and below	100	14.6	69	15.2

The analysis of data reveals that in Math's number of periodicals providing one frequency of use is as high as periodicals providing one frequency of use is as high as periodicals in 26 in JNU, 19 in CSL(DU) their contribution 1.8% 2.4% 0.7% respectively to total use.

Was computed with the help of computer, by making pairs of indicators on use data of the CSL (DU) taken as a sample all the three subjects.

C11 PERIODICALS USED BY SCIENTISTS IN MORE THAN ONE SUBJECT

While analysing the use of periodicals it has also been identified that quite a few periodicals are used in more than one subject. An attempt, therefore, has been made to identify and list such periodicals. The list so prepared has been given in Appendix 10.

The analysis reveals that there are 45 periodicals which are used in all the three subjects Physics, Chemistry and Math's, besides 70 periodicals are used both Physics and Chemistry, 66 periodicals are used both in Math's and Physics, and 10 periodicals are used both in Math's and Chemistry.

It shows that research activity being undertaken in India by scientists of the both university libraries understudy is interdisciplinary in nature, as the use of periodicals in the three subjects has revealed. Scientists use and depend on periodicals published in other subjects also for their information needs. This dependency is more in Physics and Chemistry and also in Math's and Math's and much less in Physics and Chemistry.

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CHAPTER 5

FINDINGS, SUGGESTIONS, AND AREAS OF FURTHER STUDY AND RESEARCH

1 INTRODUCTION

Present study has been conducted to study the "Availability and Use of Periodicals in the Field of Physical Sciences In University Of Delhi And Jawaharlal Nehru University Library: A Comparative Study". The both university libraries selected for the purpose are: CSL (DÜ) and JNU Library. Use of periodicals has been studied by using five indicators. These are: In Library Use; Citations, Photocopy Use, Inter Library Loan Use and Assessed Use. The use of documents in a library in general, and periodicals in particular, is affected by their availability, services, and facilities provided for their use by the library as well as information seeking behaviour of scientists. This survey has therefore been conducted by using two sets of questionnaires one having been canvassed to the librarians and the other to the users i.e. scientists of both university libraries. The data collection through the questionnaire has been duly supported by interview technique. The records have been examined and used to fill up the gaps in data collected through above methods. Literature survey method has been used to review the literature on the subject. The analysis of data has been done taking all indicators together relationship could, be established between different indicators.

A: FINDINGS

The major findings of the study are as under:

1 TESTING OF HYPOTHESES

The hypothesis given in the first Chapter have been tested by using various methods of data analysis and proved.

2 LIBRARY MEMBERSHIP

Library membership reveals a varying trend, it is higher in JNU i.e. 9593 and lower 1484 in CSL (DU) Whereas, the membership in all three, subjects under study is, higher in CSL (DU) 1,131 and lower in JNU. Presuming that each subject is contributing equally, to the use it has been found that the total use is higher in CSL (DU) i.e. followed by JNU i.e. use, whereas average Use of periodicals of subjects under study is followed by JNU 27.65% and CSL (DU) 6.80%.

3 PHYSICAL FACILITIES

The CSL & JNU, both university libraries under study are more than 25 years old. But JNU is the oldest and was established as early as in the libraries have either separate library buildings or are housed in an area exclusively meant for the library and are located in the premises of their respective parent institution. A clear difference with regard to working hours and seating capacity in the libraries of academic institutions covered as science libraries in the present study and the libraries of both university libraries has been revealed in the analysis of data. Libraries of academic institutions are open for longer hours ranging between 71.5 and 92 hours per week. Reading room facilities and seating capacity of both university libraries, particular for

periodicals section, is highest in the by librarians and where the availability of these facilities is found to be inadequate. There is provision for separate cubicles or reading rooms for research scholars in both university libraries. Adequate physical facilities help in promoting the use of periodicals.

Reading and study environment has been found to be most congenial or congenial by more than 85% scientists in all the three subjects and in both university libraries under study. Chemistry is at the top with 90.13% scientists followed by Physics with 87.68%, and Math's with 84.21% scientists.

4 BOOK BUDGET AND DOCUMENT COLLECTION

4.1 BOOK BUDGET

The average library book budget of JNU 5.53% and 2.64% of the total institutional budget, during the year 2000-01 to 2004-05, whereas, in case of CSL(DU), libraries it ranged between 2.07% and 2.28% during the same period. Both universities libraries are spending major portion of their book budget on subscription to periodicals. It varied, on an average, between and during last five years i.e. 2000-01 to 2004-05.

4.11 GROWTH RATE OF BOOK BUDGET

The average growth rate of budget for books and other, reading materials during the year 2000-01 to 2004-05 is the higher in JNU i.e. 82.21% and lower 50.08% in CSL (DU). During the year 2004-05 has spent maximum amount in JNU i.e. Rs. 1,41,39,990 on books and other reading materials whereas, lowest amount has been spent by CSL(DU) i.e. Rs. 1,02,80,430.

4.12 GROWTH RATE OF BUDGET FOR PERIODICALS

The average growth rate of budget for periodicals during the year 2000-01 to 2004-05 is higher in CSL(DU) i.e. 78.58% and lower in JNU i.e. 76.78%. During the year 2004-05 CSL(DU) had spent maximum amount on periodicals i.e. Rs. 1,90,30,220 and minimum had been spent by JNU i.e. Rs. 1,18,30,385.

4.2 LIBRARY COLLECTION

4.21 ACCESS TO COLLECTION

Both universities libraries have open access to their collection of books and periodicals (current and back volumes both) either in printed form or in non-printed form (i.e. On line Journal, E-Journal etc.).

4.22 BOOKS AND OTHER READING MATERIALS

The total size of the book collection during the year 2004-05 in both universities varied between 12, 90,052 in CSL(DU) and in JNU 12, 86,011. The average growth rate of book collection during 2000-01 to 2004/05 varied between 5.03% in JNU and 4.59% in CSL(DU) respectively except non-printed form in both university libraries.

4.23 PERIODICALS

JNU library holds maximum number of periodicals and the average percentage growth of periodicals during the year 2000-01 to 2004-05 is higher in JNU and lower in CSL(DU). With regards to subscription to current periodicals in various subjects it has been revealed followed in JNU periodicals

i.e. 2.81% and lower in case of Math's, JNU library is receiving all three subjects it is only in math's that more than 50% respondents information find the periodicals collection of their institutional library adequate to meet their information needs. In chemistry and physics. This percentage is much lower and is respectively. Three subjects, it is only in that more than 50% respondents i.e. 53.36% find the periodical collection of their institutional library adequate to meet their information needs. In Chemistry and Physics this percentage is much lower and is 32.48% and 34.12% respectively.

5 LIBRARY SERVICES

5.1 AWARENESS OF LIBRARY SERVICES

Lending and photocopying service have been found to be the best known services as more than 91% and 95% scientists respectively in all the three fields under study are aware of these services. Further, more percentage of physicists are aware of other services like ILL, Reference, Bibliographical, CAS, SDI, and Translation service to the extent of 86.26%, 87.68%, 76.78%, 70.14%, 62.09%, 78.67% and 29.38% respectively. The awareness of library services to scientists in Math's and Chemistry is much less as compared with Physics. However, the more scientists are aware about reference service with 84.75% and 73.68% respectively and least known is translation service with 8.52% and 1.75% respectively. It would be relevant to mention that scientists Math's in use the periodicals most as far as the absolute frequency of use is conceived.

5.2 PROVISION OF LIBRARY SERVICES

Lending Service inter library loan, reference and photocopying services; have been claimed and confirmed librarians of libraries, whereas, latest issues all periodicals received by the library and other material are not being displayed in due or shortage of However, the latest issues of selected periodicals are on display in JNU and other documents are not being displayed due to shortage of space. The provision of Bibliographical, CAS and SDI services has been claimed by, JNU library. In CSL (DU) all these services are not provided on regular basis, Translation services are not being provided directly by both university libraries, but these facilities are arrange through NISCAIR(formerly known as INSDOC).

5.21 LENDING OF PERIODICALS

The provision of loaning out current periodicals has been confirmed by 20 to 35% scientists, whereas, lending of back files of periodicals has been confirmed by 37% to 67% scientists in all three subjects of study. More than 70% scientists in math's and Physics have suggested not to loan out current periodicals, whereas, 59% in Chemistry have suggested loaning of current periodicals. Back files of periodicals have been suggested for being loaned out by 64% to 84% scientists in all the three subjects.

5.22 INTER LIBRARY LOAN OF PERIODICALS

With regard to ILL services 78% scientists in Physics, 40% in chemistry, 35% in math's have confirmed ILL services and 46% to 56% scientists in all three subjects have indicated that library takes more than one week to acquire a periodical on ILL.

5.23 INFORMATION SERVICES

Services like searching of periodicals, searching of specific information has been confirmed by more than 79% and 56% scientists respectively in all the three subjects, and more than 79% scientists have suggested provision of reference service. Bibliographical, CAS, and SDI services have been indicated as 'Most Useful' and 'Useful' by more percentage of scientists in than in Chemistry and Physics. More percentage of scientists in chemistry than in physics and math's. More than 41% scientists in chemistry and math's are satisfied with available services and sources of I/A Whereas in Physics it is only 33%. More than 80% scientists in all the three subjects use photocopy services provided in the library.

Scientists in Chemistry (45.61%) have revealed that library takes less than an hour to get the photocopy work done, whereas, in Physics and maximum percentage i.e. 24.64% and 32.29% respectively have stated that library takes 3 to 5 hours for photocopying work.

5.25 TRANSLATION SERVICES

Availability of translation services has been denied by 100% scientists in Chemistry, 99.6% in math's and 83.88% in Physics in both university libraries.

5.26 COMPETENCE AND BEHAVIOUR OF LIBRARY STAFF

It has been found that more than 90% scientists in math's, 88% in Physics, and 79% in Chemistry feel that library staff is competent or most competent to meet their information needs, whereas, comparatively less

percentage of scientists i.e.84.36 % in Physics, 85.09 % Chemistry and 69.06 % in math's find that the behavior of staff is most helpful or helpful.

6 USE OF LIBRARIES

6.1 PREFERENCE OF USE OF LIBRARY AND FREQUENCY OF VISIT

More than 25% scientists in all three subjects under study i.e. Physics, Chemistry and math's prefer to use institutional library for their information needs followed by use of personal libraries and other libraries. Scientists in Chemistry and Physics are more frequent visitors to the library than scientists in math's. Number of daily visitors to library is more in Chemistry i.e. 35.09% than in Physics i.e. 25.59% and Math's i.e. 23.77% which shows that scientists in Chemistry make regular use of their library. Generally stated reason for infrequent visits of scientists to the library is that library collection does not meet their information needs.

6.2 TIME SPENT ON STUDY AND READING IN THE LIBRARY

The study reveals that physicists spend more time on study and reading inside the library i.e. 7.58% scientist in Physics spend more than 30 hours in the libraries of their respective institutions; whereas, 4.04% scientists in math's and 2.83% in Chemistry spend more than 30 hours. The maximum percentage of scientists spending 11-20 hours as well as 'less than 10 hours' comes from Chemistry with their percentage, 24.56% and 69.30% respectively whereas, in math's 15.25% scientists spend 21 to 30 hours on reading inside the library. The data that higher percentage of scientists in spending 21-30

hours in the library bear a similarity with the total use data in so far as the total use is concerned because scientists in chemistry top in total use (absolute) of periodicals.

6.3 PURPOSE OF VISIT TO THE LIBRARY

The purpose of visit as stated by 44% scientists in Physics and 39% in any is to consult documents for, research followed by updating knowledge and to borrow and return documents, whereas, in Chemistry above 31% scientists visit the library to borrow and return documents followed by updating knowledge and consult documents for research.

7 USE OF PERIODICALS

7.1 PREFERENCES FOR TYPE OF DOCUMENTS USED

The periodical is most preferred category for more than 78% scientists in all the three subjects the break up being 84.2% in Chemistry 80.57% in Physics and 78.10% in Indexing and abstracting sources occupy second rank for scientists in Chemistry and Whereas, in physics review literature is preferred over indexing and abstracting sources. Other categories of documents preferred are review literature, research reports, books and monographs, conference proceedings, etc. Books and monographs occupy comparatively lower rank in Chemistry and Physics than in maths. Handbooks and Data compilations, trade temperature, patents and standards, dissertations and theses are comparatively less used documents by scientists. This conforms well to the findings of Brown that scientists are more dependent on periodicals than on books, and the dependence of chemical scientists on

serials is greater than in other field in science according to Brown for a Chemical Scientists 93% use is from serials whereas for Physicists 90.3% and for mathematicians 86.1%.

Thus hypothesis that scientists prefer periodicals over monographs is proved and the implication of finding is that both university libraries should give first priority to acquire and maintain periodicals.

7.2 PURPOSE OF USING PERIODICALS

The study has revealed similar trend in purpose of using current issues of periodicals in all three subjects understudy. The maximum percentage of scientists i.e. 47.39% in Physics, 41.23% in Chemistry and 35.87% in math's use current issues of periodicals for research work. This is followed by browsing and updating knowledge, search for specific information, and consulting periodicals for class room teaching; and the Back files of periodicals are used mainly for research work and for searching specific information.

7.3 SOURCES INITIATING SCIENTISTS TO ACCESS A PARTICULAR PERIODICAL

The study has revealed that Indexing and Abstracting Sources are the main initiating sources for use of a particular periodical for 32% scientists in Chemistry, 25% in Physics and above 31% in math's. In Chemistry it is followed by citation in the articles, direct browsing, and discussions with colleagues; in Physics direct browsing occupies second rank followed by citations in articles, discussions with colleagues; whereas, indications in articles occupies second rank followed by discussions with colleagues,

attending conferences and direct browsing. Invisible colleges as initiating source to use a particular periodical occupy lowest rank in all subjects under study.

7.4 ALTERNATIVE METHODS USED IN CASE OF NON AVAILABILITY OF A PERIODICAL

In case of non availability of periodicals in one's institutional library, most of the scientists in all the three subjects would use periodicals in other libraries. In Chemistry it is followed by the alternatives like borrowing personally from other libraries, requesting library for obtaining it on ILL, requesting the authors to send reprint and so on. In physics, scientists prefer to request the author to send reprints and pre-prints followed by getting it on ILL and borrowing personally from other libraries. In requesting author to send reprint, borrowing personally from other libraries, requesting library to get it on ILL are the alternative methods used by scientists. Further, in case of non availability of a periodicals 39% to 47% scientists would request the Library to subscribe to a needed periodical and for above 58% scientists from these lack of fund is the reason for not subscribing the requested periodicals.

7.5 RESEARCH OUTPUT Vs USE OF PERIODICALS

The study has revealed that among the entire three subjects under study, scientists in the field of Chemistry are most productive and on an average produce 2.38% publications per year on followed by physicists, and mathematicians with 2.14% and 2.03% publications respectively.

However, there is no relationship between productivity and use of periodicals by scientists. The average use of periodicals being 13.70, 8.89 and 9.0 in Chemistry, Physics and Math's respectively.

7.6 SCIENTISTS NEEDS OF PERIODICALS Vs FREQUENCY OF CUMMULATIVE USE

The data collected on use of periodicals through various indicators taken in each subject in all the libraries reveals that a major portion of use of periodicals is contributed by a small number of periodicals which confirms to the Brad ford's Law of scattng. The present study statistically reveals that 90% of the use in Chemistry. Further 50% use is contributed by around 15% of used periodicals in Physics, 12.5% periodicals in Chemistry and by 14.4% periodicals in math's.

It has also been found on the basis of data for all the indicators taken together that a small percentage of periodicals are used most frequently. Periodical supply in 26 and more of use being 17.3% in chemistry, 16.6% periodicals in physics, and 15.1% in math's on an average. These contribute to 57.7%, 51.16% and 49.66% use respectively in both university libraries in Delhi whereas, 11 and above frequency of use has been contributed by 36% periodicals in Chemistry, 41.58% in Physics, and 39.12% in math's with their contribution to use being 80.6%, 82.15% and 81.66% respectively. The finding is identical with that of Fussler i.e. 32% and 25.3% frequently used periodicals in chemistry and Physics respectively contribute to 68.5% and 69.9% use thus the hypothesis periodicals account for major portion of use is proved.

7.7 PATTERN OF USE OF PERIODICALS

The study has revealed that list of core periodicals and rank list based on total use of periodicals differs from library to library (Appendix 3 to 10) with the decrease in number of participating libraries, the number of periodicals having common used increases. This use pattern is similar in all the three subjects under study. There are only 8, periodicals in chemistry 7 in Physics and 16 in which are commonly used by scientists (with different ranks) in both university libraries under study whereas 65 periodicals in

Chemistry 86 in Physics and 91 in math's are used by scientists in both university libraries. However, 237 periodicals in chemistry. 272 physics and 313 in maths are used by scientists in one library only.

Further, it has also been found that the use pattern of specific titles of periodicals in three disciplines under study does not exhibit any relationship or found out in the interdisciplinary usage of periodicals by scientists.

7.8 USE Vs AGE OF PERIODICALS

With a view to decide on retaining and discarding policy of periodicals in subjects under study the analysis of data based on different indicators, analyzed in terms of their use in relation to age, has revealed that periodicals of last 5 to 6 years contributed to more than 50% use. In Chemistry 51.3% use has been contributed by the periodicals of last 5 years, in Physics 53.8% use by periodicals of last 6 years and in 54.06 % use by periodicals of last 6 years whereas, periodicals up to 22 years age have contributed to 94.7% use in Chemistry. 91.2% use in Physics and 91.1% use in. It shows that statistically scientists in chemistry use current information more than those in Physics and math's. Further, in case, library decides to meet 90 needs of scientists, the periodicals of last 22 years should be retained and rest could be kept for remote storage. These findings also prove the hypotheses that current periodicals are more used than one respective ones. However, there is a deviation from the finding of Brown who has identified that 91% use in Chemistry is from periodicals published during last five decades, in Physics, from those published during last two decades, and in 89% use is from periodicals of last three decades. The reason for this deviation can be that Browns; findings, are based on citations only, whereas, the present study is based on all the five indicators including citations. Further, it has been found ,the half life (50 % use) physical science periodicals in both university libraries in Delhi on an average is 5.4 years Chemistry, 6 years in Physics and 5.8 years in math's. whereas, point of

obsolescence of (i.e. according to strair 85% use) is 13 years in Chemistry, 16.6 years in physics, and 16 years in math's. These findings are in conformity finding of chen who has identified that half life of physics periodicals is 5.5 years; and the according to Flynn study of Pittsburgh university the use of periodicals older than 25 years in 5% in science subjects is Pittsburgh university.

7.9 USE Vs. TYPES OF PUBLISHER

The study has revealed that 38.06% scientists in Chemistry, 57.35% in Physics and 46.64% in math's give weightage to publisher for use of periodical. Among these the periodicals of Academic and Research Institutions are the most preferred category for 72.73% scientists in ,Chemistry, 63.46% in Math's 59.50% in Physics; followed by the periodicals brought out by learned societies which ranges between 25% and 38.02%. Only 1.1% to 3% scientists give preference to use Government publications, and the use of periodicals published by Commercial organisations is as low as 0.83% in Physics, and 2.89% in math's. This finding would be helpful in selection and acquisition of periodicals.

7.10 USE VS COUNTRY OF ORIGIN

The present study reveals that periodicals published from 4 countries together i.e. USA, UK, India and ; Netherlands contribute to 79.32% use of Chemistry, 87.84% of Physics and 77% of math's Periodicals. USA occupies first, rank for contributing maximum percentage of use in all the three subjects. In Chemistry this contribution is 32.59% for 121 periodicals, followed by UK i.e. 30.02% for 80 periodicals, India 10.04% for 38 periodicals, Netherlands 6.67% for 29 periodicals etc. In Physics the contribution of periodicals from USA is 51.43% for 164 periodicals followed by UK 19.23% for 94 periodicals, India 9% for 63 periodicals, and Netherlands 8.18% for 38 periodicals. In math's 139 US periodicals

contributed to 28.89% use followed by India 20.18% for 112 periodicals, UK 18.98% for 89 periodicals and Netherlands 9.04% for 41 periodicals. Thus it has been proved that periodicals of foreign origin are preferred over the periodicals published from India.

This finding is at variance with the findings of c. Fussler for periodicals in Chemistry and Physics and the findings of Brown for Science subjects. The variation being in relation to the use of periodicals from India and Netherlands as well as percentage use of periodicals from, different countries. The present study finds that periodicals originated from India get third rank in Chemistry and Physics, whereas in math's these occupy second rank.

7.11 USE Vs LANGUAGE OF PERIODICALS

English language is the most preferred all the three subjects under study of both CSL(DU) and JNU scientists.

7.12 USE VS. SELF SUFFICIENCY

In Chemistry, the availability of used periodicals is highest in CSL(DU) 50.3%, JNU 46.74%. In Physics the availability of periodicals is highest in JNU 37.10% and in CSL(DU) 34.01%. In math's the availability of periodicals is as high 92.93% in JNU 84.96%, and CSL(DU) 64.07%, it can, therefore, be concluded that availability of used periodicals is highest in math's and lowest in Chemistry. Further self sufficiency rate in periodicals collection in math's is more than that of Chemistry or Physics.

7.13 USE Vs. SUBSCRIPTION OF PERIODICALS

The study has revealed that in Chemistry the percentage use of subscribed periodicals is highest in CSL(DU) and the lowest in JNU whereas, in Physics the use of subscribed periodicals is highest in CSL(DU) and lowest is in JNU. In math's also the use of subscribed periodicals is highest in CSL(DU) whereas, lowest is in JNU.

7.14 USE Vs FORMS OF PERIODICALS

97% scientists in Physics, 95% in Chemistry and 93% in math's use periodicals in non-printed form (On line Journals, E-Journals and so on.). Among the scientists using periodicals in other non conventional form majority use, whereas only 5% scientists of all three subjects, preferred in printed form only in both university libraries understudy.

7.15 PERIODICALS USED BY SCIENTISTS IN MORE THAN ONE SUBJECT

The study has also revealed that there are 45 periodicals (Listed in Appendix10) which are being used by scientists in all the three subjects. Besides these, 70 periodicals are being used by scientists in chemistry, Physics, and 66 are commonly used by scientists in math's and Chemistry and only 10 periodicals are used by scientists in math's and physics.

This shows that scientists use and depend on the literature published in other than their own subject to meet their information needs; the use and dependency is more with scientists in chemistry and Physics, than in math's and chemistry and much less in math's and Physics.

7.16 REMOTE STORAGE AND DISCARD POLICY

The decision with regard to remote storage or discarding of a periodical can be taken by relating use frequencies and contribution to use supplied by a periodical in relation to available resources with the library. However, periodicals supplying frequency of use of less than 5 could easily be considered for remote storage. Number of such periodicals ranges between 32 to 70 in chemistry, 21 to 126 in Physics, and 23 to 121 in math's in both libraries under study. However, Periodicals having frequency of use as 2 can be discarded depending upon the available resources and. funds of library.

7 CONCLUSION

The present study reveals that basic physical facilities in both selected university libraries in Delhi are satisfactory.

User studies done by one indicator can not be taken as a valid guide to take any policy decisions on subscriptions to periodicals. Further, the rank based on use of a periodical may differ from both university libraries. It is, therefore, advisable not to depend on user surveys done by other libraries to make any policy decisions with regard to maintaining or subscribing, discarding or discontinuing a periodical.

Periodicals have been identified as most useful category of document by scientists in Delhi in all the three fields under study, with regard to periodicals collection more than 80% scientists in Chemistry, Physics and math's have revealed the available periodicals collection in their respective libraries as 'useful' or 'most useful' but the need to subscribe to more periodicals has also been indicated and suggested by scientists in varying percentages i.e. 46% in math's 65% in physics and 67% in chemistry as they depend on other libraries to meet their information needs. Further, periodicals

published from academic and research institutions are preferred over periodicals published by learned societies, Government or commercial publishers. Scientists prefer to use periodicals in non-printed form (i.e. On line Journals, E-Journals and so on.) and in English language.

On an average 53.8% in physics, 50.8% used periodicals in chemistry and 57.8% in math's provide 90% of use, whereas, 50% use is provided by 15% in physics, 12.5% periodicals in chemistry and 14.4% in math's. Further, a small percentage of periodicals is used of most frequently and only 16.6% in physics, 17.3% periodicals in chemistry and 15.1% in math's supply 26 and more frequencies of total use.

In selected both university libraries in Delhi, half life of periodicals on an average in 6 years in physics, Chemistry is 5.4 years and 5.8 years in math's, whereas, point of obsolescence is 16.6 years in Physics, 13 years in Chemistry and 16 years in math's.

B SUGGESTIONS

With a view to promote the use, the scientists were asked to give suggestions. They have touched many areas and some of the important areas are given here under:

Libraries need to have good physical facilities for its proper use. Though both University Libraries provide basic facilities but the need for more reading space is felt and suggested by scientists in CSL(DU). Further the provision of a separate reading rooms/Cubicles have been suggested by scientists in JNU. The scientists of CSL (DU) feel concerned with the cleanliness of book. Shelves and have suggested the provision of air conditioned reading halls. However, scientists in CSL (DU) have suggested more working hours of the library.

The stoppage and cuts or disproportionate increase in library budget has been criticized in loud voice both by the scientist and librarians in both university libraries under study. The provision of more funds particularly for periodicals has been greatly emphasized by scientists in CSL(DU) and JUN. to over come the present situation regarding resource crunch scientists of CSL(DU) suggested to have better Networking amongst different libraries.

The need for better facilities like computerized information services, online Journals, E-Journals has been emphasized and suggested. Further the need for centrally located library of the status as a national library has been felt by many scientists and this should have connections with local, state, regional, national and international level networks.

The gearing up specialized information services such as CAS and SDI and participation of both University libraries in networks is another important area which is suggested by scientists in the both university libraries under study.

C AREAS OF FURTHER RESEARCH

1. An important area of further research which is in the context of available monetary resources and increasing cost of print as well as not print periodicals in relation to their use of i.e. cost effectiveness and cost benefit studies has been a neglected area of research in India.
2. Scientist's needs for information are becoming highly specialized. it is therefore, suggested that resource sharing through networking in such highly specialized areas by using advanced technological aids and computers should be examined and studied.
3. The non- use is more important than the use of periodicals and studies be undertaken to identify the factors responsible for non- use
4. Inter and intra disciplinary research in physical science has been gaining importance. The scientist's dependence and periodicals of other areas, needs further study.

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QUESTIONNAIRE
(Canvassed to Librarians)

- Note: 1. The questions can be answered either by putting a tick mark () or by writing an appropriate code number given in the bracket. Some of the questions would, however, require filling up the statistical data.
2. In case, the space provided for an open ended question is insufficient extra sheet may please be used.

A. GENERAL INFORMATION

- a) Name of the Library _____
- b) Name of the Parent Organisation/ Institution /Ministry _____
- c) Address _____
_____ PIN _____
- d) Telephone No. _____
- e) Name of the Librarian _____

A.1 Working Hours

- a) What are the working hours of the library, and of the periodical section?

Days	Timings	
	Library A.M. to P.M.	Periodical Section A.M. to P.M.
1	2	3
Normal Working Days		
Saturdays		
Sundays		
Holidays		
Vacations		

A.2 Library Rules

- a) Does the library have written statement about the library rules and regulations? Yes () No ()
- If yes, please attach a copy of the same.

A.3 Membership

- a) Kindly give break up of library membership

Categories of members	2000-01	2001-02	2002-03	2003-04	2004-05
Faculty					
Research Scholars					
Scientists					

Others					
Total					

A.4 Physical Facilities

- a) Kindly mention the number of reading seats:
- In the library _____
 - In the Periodical Section _____
- b) Please indicate the adequacy of reading seats provided by the library by filling in appropriate code (Most Adequate -1, Adequate -2, Not adequate -3)
- Reading Seats in the Library ()
 - Reading Seats in Periodical Section ()
- c) Does the library have separate reading room facilities for following categories of readers? If yes, please mention the number of seats available.

Categories of Readers	Reading Rooms/Cubicles		Number of Seats
	Yes	No	
Faculty			
Research Scholars			
Scientists (By Designation)			
Others			

A.5 Access to Documents on shelves

- a) Does the Library provide open access to
- | | | |
|---------------------------------|-----|-----|
| | Yes | No |
| ▪ Books/Monographs | () | () |
| ▪ Current Issues of Periodicals | () | () |
| ▪ Back Files of Periodicals | () | () |
| ▪ Other Documents | () | () |

A.6 Display of Periodicals and Latest Publications

- a) Does the Library organise regular display of current periodicals? Yes () No ()

A.7 Shelving

- a) Please give the number of periodicals re-shelved daily (on an average).
- | | |
|---------------------------|-------|
| Current Periodicals | _____ |
| Back Files of Periodicals | _____ |
- b) How frequently periodicals are shelves?
- | | |
|-------------------------------|-----|
| Every Hour | () |
| Twice a day | () |
| Once a day | () |
| Whenever need arises | () |
| Others (Please specify) _____ | () |

B. BUDGET

- a) Kindly give break-up of the institutional budget and book budget of the library

Financial year	Budget of the Institution	Book Budget of the Library

2000-01		
2001-02		
2002-03		
2003-04		
2004-05		

b) Kindly give year wise break up of the book budget of the Library

Financial year	BOOK BUDGET			
	Books	Other documents	Periodicals	Total
2000-01				
2001-02				
2002-03				
2003-04				
2004-05				

c) Kindly indicate the adequacy of the book budget for book and periodicals
Adequate-1, adequate-2, Periodicals Not Adequate -3) ()

(Most

C. STAFF

a) Kindly indicate the staff strength and their deployment in different sections of the library. (Professional staff includes those possessing qualification of B.LibSc. and above; Semi Professional staff includes those possessing certificate or diploma in Library Science; Non Professional Staff includes staff without any professional qualifications).

Section	Staff Strength		
	Professional	Semi Professional	Non Professional
1	2	3	4
Lending (loan/circulation)			
Acquisition			
Processing			
Periodical			
Reference			

Documentation (Bibliographical, Indexing, Abstracting, CAS, SDI)			
Total (All Sections)			

D. COLLECTION

a) Does the library had written statement or policy for acquisition of following:

- Books / Monographs Yes () No ()
- Periodicals Yes () No ()
- Other type of documents (Please specify) Yes () No ()

If yes, please attach a copy of the policy document.

c) Kindly give a break up of library collection

Year	Library Collection				
	A Books	B Periodicals	C Other Documents	D*	E**
2000-01					
2001-02					
2002-03					
2003-04					
2004-05					

D* Total acquisition during specified year.

E** Total collection

d) Kindly give the break up of periodicals received in the library according to broad subject fields o knowledge.

Financial Year	Periodicals				
	Sciences	Social Sciences	Humanities	Others	Total
2000-01					
2001-02					
2002-03					
2003-04					
2004-05					

- e) Kindly give subject wise break up of science periodicals received by the library.

Financial Year	Science				
	Chemistry	Physics	Math's	Others	Total
2000-01					
2001-02					
2002-03					
2003-04					
2004-05					

- e) If there is decline number of periodicals received by the library, kindly indicate the reason.

▪ lack of found in case of subscribed periodicals ()

▪ titles not in much use ()

▪ sharing arrangement with other library /libraries ()

▪ Shift in thrust areas of research ()

▪ Any other _____ (Please specify)

- f) Kindly give language wise break up of periodicals received in the library according to country of origin.

Financial Year	Indian	Foreign
2000-01		
2001-02		
2002-03		
2003-04		
2004-05		

- g) Kindly give language wise break up of periodicals received in the library.

Financial Year	Number of Periodicals	
	English	Other than English
2000-01		
2001-02		
2002-03		
2003-04		
2004-05		

h) Kindly give form wise breakup of periodicals received in the library.

Financial year	Printed	Microfilm	Microfiche	Others form
2000-01				
2001-02				
2002-03				
2003-04				
2004-05				

E LIBRARY SERVICES

E.1 Lending Service

a) Does the library provide loan facility for following categories of periodicals:

- Loose issues of current periodicals Yes () No ()
- Bound issues of current periodicals Yes () No ()
- Loose issues of back volumes of periodicals Yes () No ()
- Bound issues of back volumes of Periodicals Yes () No ()

b) Please indicate the categories of users to whom loan facility is provided by the library.

Periodicals				
Current			Back Volumes	
Categories of Users	Loose Issues	Bound issues	Loose Issues	Bound Issues
Faculty				
Research scholars				
Scientists (By Designation)				
Other (Please specify)				

c) Kindly give the subject-wise break up of current periodicals loaned to users:

Year	Current Periodicals Loaned Out				
	Chemistry	Physics	Math's	Others	Total
2000-01					
2001-02					
2002-03					
2003-04					

2004-05					
---------	--	--	--	--	--

d) Kindly give the subject wise break up of back volumes of periodicals loaned out to users:

Year	Back volumes of Periodicals loaned out				
	Chemistry	Physics	Math's	Others	Total
2000-01					
2001-02					
2002-03					
2003-04					
2004-05					

E.2 Inter Library Loan Services

a) Does the library borrow periodicals on Inter-Library Loan for its users?

Yes () No ()

b) Does the library loan out periodicals on Inter-Library loan for users?

Yes () No ()

If yes, please indicate the category of users for whom the periodicals are borrowed inter-library loan?

c) Categories of Users

Faculty

Research Scholars

Scientists

Others _____

(Please Specify)

d) Kindly list the names of the libraries with whom the library has resource sharing arrangements.

■ _____

■ _____

■ _____

E.3 Reference Service

a) Does the library provide reference service?

Yes () No ()

■ to search the document

Yes () No ()

■ to search the periodical

■ to search the specific information

from reference sources

Yes () No ()

■ to search specific information from periodicals

Yes () No ()

E.4 Bibliographical Service

a) Does the library provide bibliographical service to its users?

If yes, how?

Yes () No ()

■ On demand

Yes () No ()

■ In anticipation

■ Are the periodical articles listed in bibliographies demanded by the users.

Yes () No ()

E.5 Current Awareness Service (CAS)

- a) Does the library provide CAS bulletin?

If yes, please indicate

- Title of Bulletin _____
- Year of starting _____
- Periodicity _____
- Subjects covered- _____
- No. of periodicals covered _____

Please attach a copy of latest CAS bulletin

E.6 Selective Dissemination of information (SDI)

- a) Does the library provide SDI Services?

Yes () No ()

- b) If yes, please indicate the category of users to whom this service is provided.

- To Faculty ()
- To Researchers ()
- To Scientists ()
- To Others _____ ()

(Please Specify)

E.7 Photocopying Service

- a) Does the library have Photostating and Xeroxing Facility in the Library?

Yes () No ()

- If yes, is it paid or free of cost?

Paid ()

Free of cost ()

- If paid, please mention charge per exposure _____

- b) Does the library have some outside arrangement for getting the periodical articles Photostat/Xeroxed?

Yes () No ()

E 8 Translation Service

- a) Does the library provide translation service?

Yes () No ()

If no, does it arrange from outside?

Yes () No ()

F. COMPUTERIZATION OF LIBRARY SERVICES

- a) Does the library give computerised information services to its readers?

Yes () No ()

- If yes, kindly tick the services.
- Holding Lists/union catalogues ()
- Bibliographical Services ()
- On - line information service ()
- Others _____ ()

(Please specify)

G. PARTICIPATION IN NETWORK

- a) Does the library participate in library and information networks?

Yes () No ()

If yes, list the name of networks in which the library is participating.

If no, does it intend to participate in near future?

Yes () No ()

H. OTHER FUNCTIONS

H.1 Union Catalogues

- a) Does the library maintain union catalogue of periodicals? Yes () No ()

H.2 Weeding out

- a) Has the library weeded out any periodicals during last 5 years? Yes () No ()

If yes, please indicate the reason.

- Periodicals were not in use ()
- Physical condition of volume was bad ()
- Shift in thrust areas of research ()
- Lack of Space ()
- Others ()

(Please specify)

I. OVERALL EVALUATION

- a) Have you done any use survey of periodical collection of your library? Yes () No ()

- b) If yes, kindly mention its salient findings

- c) Kindly list 10 periodicals in each of the subjects of Chemistry, Physics, and Math's, frequently used by the readers of your library and rank them according to their use. (by ranking in order of priority i.e. Most frequently used as 1, less frequently as 2,10). (a separate sheet may be used for the list, if required)

- d) In your opinion out of the following options what will initiate more use of periodicals? Kindly rank these by using rank order in order of priority (first priority -1, second priority -2.....)

- Acquisition of more number of periodicals ()
- Extensiveness in coverage and quality in contents ()
- Physical facilities and improvement therein ()
- Timely shelving, Shelf representation and Display Arrangements ()
- Better environment for study and research. ()
- Library oriented teaching. ()
- Others ()

(Please specify)

- e) Does the library have any perspective plan for its growth and development? Yes () No ()

If yes, please give the salient features of plan particularly in relation to the periodicals collection development and their use.

J. SUGGESTIONS

Please give your suggestions about the improvement of library facilities, use of library, teaching methods adequacy of library staff, adequacy of budget, and so on.

QUESTIONNAIRE ADMINISTERED TO USERS

Mahender Pratap Singh

Lecturer

Deptt. of Library and Information Science

Bundelkhand University

Jhansi - 284128

Dear Sir/Madam,

I am a Ph D. student and registered with the Institute of Library and Information Science, Bundelkhand University, Jhansi. The topic of my research is **"Availability and Use of Periodicals in the field of Physical Sciences in University of Delhi and Jawaharlal Nehru University Library: A Comparative Study"**. My Research supervisor is Prof. M.T.M. Khan, Head of the Deptt. of Library and Information Science, Bundelkhand University, Jhansi-284128

With a view to collect data required for the study I have designed the enclosed questionnaire besides using other indicators for this purpose. I am seeking your kind cooperation in filling up the same. The date supplied by you will be of immense value for this study and will be used for the research purpose only.

I am aware of your busy schedule but without your assistance my project will be incomplete. I shall be grateful if you would kindly spare some time from your busy schedule and fill up the questionnaire.

Thanking you,

Yours sincerely,

(Mahender Pratap Singh)

Research Topic: "Availability and Use of Periodicals in the field of Physical Sciences in University of Delhi and Jawaharlal Nehru University Library: A Comparative Study"

QUESTIONNAIRE

(Canvassed to Users)

- Note: a. Most of the questions given below, can be answered by putting a tick mark () in the appropriate box.
b. For some questions codes have been provided within brackets which may be filled in the given box.
c. In case the space provided for open ended questions is insufficient, additional sheet may please be used.

A PERSONAL DATA

- a) Name: _____
(Surname) (Forename)
b) Institution Employed with _____
c) Status (Faculty-1, Researcher-2, Scientists-3, Others-4) ()
d) Broad subject of study and Research
(Chemistry - 1, Physics - 2, Math's-3) ()
e) Which activity takes most of your time? ()
(Teaching-1, Research-2, R&D-3,
Management and administration -4, Others-5)

A.1 PUBLICATIONS

Please give details of publications brought out by you during last 5 years (2000/2001 to 2004/2005)

- | Type of Publication | Number |
|--|--------|
| a) Books (including Monographs, Thesis etc.) | _____ |
| b) Articles/Research Papers in Periodicals | _____ |
| c) Research Reports | _____ |
| d) Book Reviews | _____ |
| e) E-publication/Online | _____ |
| f) Others | _____ |

B. USE OF LIBRARY

- Which library you prefer to use for you information needs? ()
(Institutional Library-1, Personal library-2, other libraries-3)

B.1 PURPOSE

Please indicated the purpose of visit to the library of your institution

- a) To borrow and return documents ()
b) For light reading ()
c) To update knowledge ()
d) To consult documents for research ()
e) To consult documents for class room teaching ()
Others (Please specify) _____ ()

B.2 FREQUENCY OF VISIT

- a) How often you visit the library of your institution ()
(Daily-1, Twice a week- , once a week-3, Occasionally-4, Never-5).
If you are not a regular user of the library, please specify reason/s.
b) Library is far away from place of work ()
c) Library is far away from place of residence ()
d) Working hours of the library are not convenient ()

- e) Collection of the library does not meet information needs ()
 f) Library environment is not congenial for study and research ()
 Others (Please specify) _____ ()

B.3 TIME SPENT ON READING

- a) How much time do you spend on reading inside your Institutional Library ()
 (1 to 10 hours-1, 11 to 20 Hours-2, 1 to 30 Hours-3, 31 and above Hours-4)

B.4 USEFULNESS OF DIFFERENT CATEGORIES OF DOCUMENTS

Which categories of the documents (listed below) are useful to your study and research?

	Category	Usefulness		
		Most Useful	Useful	Less Useful
1	2	3	4	5
a)	Books/Monographs			
b)	Handbooks and Data Compilations			
c)	Periodicals			
d)	Indexes and Abstracts			
e)	Patents/Standards/Specifications			
f)	Conference Proceedings			
g)	Research Reports			
h)	Dissertations and Theses			
i)	Trade Literature			
j)	Review Literature			
k)	E-Publication/Online			
l)	Others _____ (Please Specify)			

C USE OF PERIODICALS

C.1 PURPOSE

Please specify the purpose of using the current issues of periodicals.

- a) For browsing and keeping update with information ()
 b) For research work ()
 c) For Classroom teaching ()
 d) For information search ()
 Others _____ ()
 (Please specify)

Please specify the purpose of using the back files of periodicals.

- e) For research work ()
 f) For classroom teaching ()
 g) For information search ()
 Others _____ ()
 (Please specify)

C.2 SOURCES INITIATING SCIENTISTS FOR ACCESS AND USE OF A PERIODICAL

Please indicate the method of gathering information for your study and research.

- a) Direct browsing ()
 b) Accessing through indexing/ abstracting periodicals ()
 c) Accessing through citations in the articles ()
 d) Discussion with colleague ()
 e) Attending conference and seminars ()
 f) Invisible College ()
 Others _____ ()

(Please specify)

C.3 PERIODICALS COLLECTION

- a) Collection of periodicals in the field of your interest in your library is adequate to meet your information needs? Yes () No ()

When required periodicals is not available in the library, please indicate the alternative method used by you to meet your needs.

C.3.1 ALTERNATIVE

- a) Consulting them in other Libraries ()
b) Borrowing them personally from other libraries ()
c) Requesting the library to borrow it on inter-library loan. ()
d) Abandoning the search ()
e) Requesting Author to send reprints ()
Other _____ ()

(Please specify)

- f) Have you ever requested the library to subscribed a new periodical?

Yes () No ()

- g) If yes, did the library subscribe?

Yes () No ()

If no, please tick the reason:

- h) Lack of funds ()
i) Authorities did not approve the subscription ()
j) Some working arrangement of sharing was done with other library. ()
k) Request was not looked into ()

Other _____

(Please specify)

C.4 USEFULNESS OF PERIODICAL COLLECTION

- a) Enclosed at appendices A,B AND C are lists of selected important periodicals in your broad subject of study and research (i.e. Chemistry, Physics and Math's). Please indicate their usefulness in relevant appendix by putting up appropriate code number.

- b) Please give the names of periodicals which have not been given in the enclosed list but are useful for your work and also please indicate their usefulness by putting the appropriate code number (Most Useful-1, Useful-2).

Name of the Periodical

- i) _____ ()
ii) _____ ()
iii) _____ ()
iv) _____ ()

C.5 OTHERS FORMS OF PERIODICAL

- a) Do you use periodicals in Non-Conventional

(Other than printed form)?

Yes () No ()

If yes, please indicate the form of the periodicals used by you

- | | Yes | No |
|---------------|-----|-----|
| b) Microfilm | () | () |
| c) Microfiche | () | () |
| d) CD-ROM | () | () |
| e) Online | () | () |

Other _____

(Please specify)

C.6 LANGUAGES

- a) Do you give Weightage to the language while using periodicals Yes () No ()
- b) If yes, please indicate the language code in which you prefer to read periodicals (English -1, Other than English-2) Yes () No ()

C.7 COUNTRY OF ORIGIN

- a) Do you give weightage to country of origin while using periodicals? Yes () No ()
- b) If yes, please indicate the code of your preference (India -1; Foreign -2) Yes () No ()

C.8 PUBLISHER

- a) Do you give weightage to publisher while using periodicals? Yes () No ()
- b) If yes, please indicate the code of your preference (learned society-1, Academic /Research - Institution-2, Government-3, Commercial-4, others-5) ()

D LIBRARY SERVICES**D.1 AWARENESS**

Are you aware that your library is providing the following services?

	Services	Awareness	
		Yes	No
a)	Lending		
b)	Inter-Library Loan		
c)	Reference*		
d)	Bibliographical		
e)	Current Awareness**		
f)	Selective Dissemination of Information**		
g)	Indexing****and Abstracting+		
h)	Photocopying or Xeroxing		
i)	Translation		
j)	Online		
	Others _____ (Please Specify)		

D.2 LENDING SERVICES (PERIODICALS)

Does the library provide periodicals on loan?

- * A service provided in person to a reader to provide information as early as possible.
- ** A service to update readers with the latest developments in the subject
- *** A personalized service giving highly relevant information of interest to the selected number of users.
- **** A service providing index to the periodical article.
- + A service providing abstracts to the periodical articles.

If yes, which periodicals are issued

- a) Current Issues Yes () No ()
- b) Back issues/volumes Yes () No ()
- If no, which periodical would you recommend to loan out?
- c) Current Issues Yes () No ()
- d) Back files Yes () No ()

D.3 INTER LIBRARY LOAN

- a) Does the library obtain periodicals on inter library loan for you? Yes () No ()
- b) If yes, how much time on average is being taken by the library to get a periodical on inter-library loan? ()
(Less than a week-1, one week-2, More than a week-3)

D.4 REFERENCE AND INFORMATION SERVICES

- Does the reference help you
- a) In searching the periodicals Yes () No ()
- b) In information search Yes () No ()
- c) If no, would you recommend that library should provide reference service? Yes () No ()
- d) The Bibliographical Service Provided by the library is ()
(Most useful-1, Useful-2, Not useful-3)
- e) The current awareness services provided by the library is: ()
Most Useful-1, Useful -2, Not useful -3)
- f) Selective Dissemination of Information (SDI) ()
service provided by the library is:(Most Useful -1, Useful -2, Not Useful -3)

D.5 INDEXING AND ABSTRACTING SERVICE

- a) Does the library provide indexing and abstracting service Yes () No ()
- b) If yes, are you satisfied with available I/A Sources and Publication Yes () No ()
- c) Are these Adequate in Coverage Yes () No ()

D.6 PHOTOCOPYING

- a) When you give an article for photocopying Yes () No ()
how much time on an average is taken to get the photocopy?
(Less than an hour - 1, Few hours -2, One day -3, More than a day -4)
- b) Are you getting Photostat done outside the library also? Yes () No ()

D.7 TRANSLATION SERVICE

- a) The translation service provided by the library is ()
(Most useful-1, useful-2, Not Useful-3)

D.8 ON LINE SERVICES

- a) The Online service provided by the library is ()
(Most useful-1, useful-2, Not Useful-3)

D.9 EVALUATION

- a) The reading environment of your institutional library is
Most congenial (), congenial (), not congenial ()
- b) The display of current issues of periodicals on the shelves is
Most helpful (), Helpful (), Not helpful ()

- c) The arrangement of back volumes of periodicals on shelves in your library is Most helpful (), Helpful (), Not Helpful ()
- d) The competence of the staff of the library is qualified to give service Most competent (), Competent (), Not Competent ()
- e) The behaviour of library staff is Most helpful (), Helpful (), Not Helpful ()
- f) The periodical collection of your institutional library is Most Useful (), Useful (), Not Helpful ()

E. SUGGESTIONS

Please give your suggestions about the library, its periodical collection, services, attitude of staff and so on.

APPENDIX I

RANK LIST OF PERIODICALS IN PHYSICS ACCORDING TO TOTAL USE IN CSL (DU)

S. No	Title of Periodicals	TU	%U	C%U	R (TU)	Rank According to Different indicators				
						CU	IU	FU-	LU	AU
1.	Physical Review Letter	193	6.62%	6.62%	1	1	2	1	10	1
2.	Applied Physical Letters	95	3.26%	9.98%	2	6	1	16	10	13
3.	Physical Letters	90	3.09%	12.97%	3	4	18	10	10	2
4.	Physical Review - D	87	2.99%	15.96%	4	2	17	13	10	11
5.	Physical Review - B	85	2.92%	18.87%	5	3	14	7	10	10
6.	Reviews of Modern Physics	77	2.64%	21.52%	6	12	6	5	10	4
7.	Nature	76	2.61%	24.12%	7	19	1	13	10	13
8.	Jr. of Physics-A General Physics	73	2.51%	26.63%	8	11	5	2	10	10
9.	Physical Review-C Nuclear Physics	73	2.51%	29.14%	8	5	15	6	10	9
10.	Jr. of Applied Physics	63	2.16%	31.30%	9	13	3	7	10	18
11.	Acoustic	50	1.72%	33.01%	10	4	30	9	10	18
12.	Indian Jr. of Pure & Applied Physics	50	1.72%	34.73%	10	21	10	4	10	13
13.	Indian Jr. of Physics	49	1.68%	36.41%	11	20	9	3	10	18
14.	Jr. of Acoustical Society of America	49	1.68%	38.09%	11	27	4	6	7	18
15.	Science	48	1.65%	39.74%	12	19	10	5	10	16
16.	Physica: Status Solidi	48	1.65%	41.39%	12	18	5	13	10	17
17.	Acta Crystallographica	47	1.61%	43.00%	13	27	11	1	10	14
18.	American Jr. of Physics	46	1.58%	44.58%	14	27	7	5	10	14
19.	Chemical Physics Letter	43	1.48%	46.05%	15	22	13	5	4	18
20.	Japanese Jr. of Applied Physics	39	1.34%	47.39%	16	20	23	7	10	6
21.	Solid State Communications	38	1.30%	48.70%	17	10	22	15	10	11
22.	Physical Review-A General Physics	37	1.27%	49.97%	18	7	28	16	10	14
23.	Pramana	37	1.27%	51.24%	18	8	22	15	10	14
24.	Physica-B: Low Temperature & Solid State Physics	36	1.24%	52.47%	19	9	29	15	4	13
25.	Physics of Fluids	34	1.17%	53.64%	20	27	18	3	10	12
26.	Current Science	33	1.13%	54.77%	21	24	8	16	10	18
27.	Annals of Physics	33	1.13%	55.90%	21	15	23	13	6	15
28.	Nucleic Acid Research	32	1.10%	57.00%	22	7	30	15	10	18
29.	Soviet Jr. of Nuclear Physics	31	1.06%	58.06%	23	19	15	13	10	17
30.	Physics Today	30	1.03%	59.09%	24	22	13	14	10	16
31.	Jr. of Physics - B Atomic & Molecular	30	1.03%	60.12%	24	14	28	16	10	8
32.	Jr. of Physical Society of Japan	29	1.00%	61.12%	25	24	13	14	7	18
33.	Physics Reports	28	0.96%	62.08%	26	12	33	16	5	11
34.	Jr. of Physics -G Nuclear Physics	27	0.93%	63.01%	27	23	33	14	10	3
35.	Modern Physics Letters	27	0.93%	63.92%	27	27	15	14	10	12
36.	Jr. of Physics & Applied Physics	26	0.89%	64.82%	28	26	32	9	10	5
37.	Nuclear Data Sheets	25	0.86%	65.68%	29	27	16	11	10	15
38.	Physica C : Atomic Molecules & Plasma Physics	24	0.82%	66.51%	30	9	30	15	10	18
39.	Proceedings of the Royal Society (London)	24	0.82%	67.33%	30	11	26	16	10	18
40.	Optics Communication	23	0.79%	68.12%	31	22	20	15	10	14
41.	Progress in Theoretical Physics	22	0.75%	68.87%	32	25	30	7	10	10
42.	Current Papers in Physics	22	0.75%	69.63%	32	27	12	16	10	18
43.	Soviet Jr. of Low Temperature Physics	22	0.75%	70.38%	32	24	22	8	10	18
44.	Nuovo Cimento	22	0.75%	71.14%	32	16	28	16	10	13
45.	Jr. of Physics-C Solid State Physics	21	0.72%	71.86%	33	24	31	13	10	6
46.	Advances in Electronics & Electron Physics	19	0.65%	72.51%	34	25	23	9	10	18
47.	Soviet Physics-JETP	19	0.65%	73.16%	34	24	23	15	10	13
48.	Australian Jr. of Physics	19	0.65%	73.82%	34	26	18	14	10	17
49.	Soviet Physics-Semi Conductors	19	0.65%	74.47%	34	20	23	14	10	18
50.	Jr. of Optical Society of America	19	0.65%	75.12%	34	26	23	15	10	11

51. Canadian Jr. of Physics	18	0.62%	75.74%	35	26	19	14	10	17
52. Physica A: Theoretical & Statistical Physics	18	0.62%	76.36%	35	20	23	15	10	18
53. Soviet Physics-Solid State	18	0.62%	76.97%	35	27	22	16	7	14
54. Proceedings of the National Academy of Sciences (USA)	18	0.62%	77.59%	35	27	18	13	10	18
55. Solid State Electronics	18	0.62%	78.21%	35	25	20	14	9	18
56. Solar Energy	17	0.58%	78.79%	36	27	28	15	2	15
57. Nuclear Physics	16	0.55%	79.34%	37	16	31	16	10	16
58. Jr. of Fluid Mechanics	16	0.55%	79.89%	37	27	33	16	1	11
59. Thin Solid Films	16	0.55%	80.44%	37	22	33	16	3	14
60. Advances in Physics	16	0.55%	80.99%	37	25	21	14	10	18
61. Solar Physics	16	0.55%	81.54%	37	27	25	14	4	18
62. Advances in Nuclear Physics	15	0.51%	82.05%	38	26	20	15	10	18
63. Physics News	15	0.51%	85.57%	38	27	18	16	10	18
64. Nuclear Instruments & Methods	14	0.48%	83.05%	39	25	23	16	10	16
65. Comments on Nuclear & Particle Physics	14	0.48%	83.53%	39	27	31	16	10	7
66. Astrophysical Jr.	13	0.45%	83.97%	40	22	28	15	8	18
67. Helvetica Physica Acta	12	0.41%	84.39%	41	27	22	15	10	18
68. JEPT Letters	12	0.41%	84.80%	41	27	32	12	10	11
69. Jr. Mathematical Physics	12	0.41%	85.21%	41	23	32	14	8	15
70. Jr. of Low Temperature Physics	12	0.41%	85.62%	41	25	24	15	10	18
71. Astrophysical Jr.	11	0.38%	86.00%	42	27	28	16	10	12
72. Jr. of Atmospheric & Terrestrial Physics	11	0.38%	86.38%	42	27	27	11	10	18
73. IEEE transactions on Magnetism	11	0.38%	86.75%	42	17	33	16	10	18
74. Molecular Physics	10	0.34%	87.10%	43	25	33	9	10	17
75. Review of Scientific Instruments	10	0.34%	87.44%	43	25	33	15	10	11
76. Optics & Spectroscopy	10	0.34%	87.78%	43	21	30	15	10	18
77. Jr. of Magnetic Resonance	10	0.34%	88.13%	43	27	23	16	10	18
78. Physica D: Nonlinear Phenomena	10	0.34%	88.47%	43	21	31	16	10	16
79. Jr. of Physics & Chemistry of Solids	10	0.34%	88.81%	43	18	33	16	10	18
80. Solid State Physics	9	0.31%	89.12%	44	24	31	16	10	14
81. Astronomy and Astrophysics	9	0.31%	89.43%	44	25	30	14	10	16
82. Philosophical Magazine	9	0.31%	89.74%	44	22	33	13	9	18
83. Applied Spectroscopy	9	0.31%	90.05%	44	27	28	15	7	18
84. Analytical Chemistry	8	0.27%	90.32%	45	24	28	16	10	18
85. New Scientist	8	0.27%	90.60%	45	27	26	16	10	17
86. Jr. of Materials Research	8	0.27%	90.87%	45	25	30	15	10	16
87. Jr. of American Chemical Society	8	0.27%	91.15%	45	24	33	16	10	13
88. Acta Physica et Chemica	8	0.27%	91.42%	45	27	28	13	10	18
89. Report of Mathematical Physics	8	0.27%	91.70%	45	24	33	16	10	13
90. Zeitschrift fuer Physik	8	0.27%	91.97%	45	20	33	16	9	18
91. Zeitschrift fuer Physik	8	0.27%	92.24%	45	21	33	16	8	18
92. Ferroelectrics	8	0.27%	92.52%	45	27	33	16	5	15
93. Jr. of Plasma Physics	8	0.27%	92.79%	45	27	28	16	10	15
94. Communications in Mathematical Physics	8	0.27%	93.07%	45	27	33	11	10	15
95. Soviet Jr. of Plasma Physics	7	0.24%	93.31%	46	25	32	13	10	17
96. Planetary & Space Science	7	0.24%	93.55%	46	27	30	13	10	17
97. Superconductor Science & Technology	7	0.24%	93.79%	46	20	33	16	10	18
98. Comments on Plasma Physics & Controlled Physics	7	0.24%	94.03%	46	27	31	11	10	18
99. Microwave Jr.	7	0.24%	94.27%	46	26	33	16	4	18
100. Report on Progress Physics	7	0.24%	94.51%	46	22	31	16	10	18
101. Classical & Quantum Gravity	7	0.24%	94.75%	46	27	33	13	10	14
102. Zeitschrift fuer Physik	7	0.24%	94.99%	46	22	33	16	10	16
103. Applied Surface Science	7	0.24%	95.23%	46	24	33	16	10	14
104. Jr. of Chemical Physics	7	0.24%	95.47%	46	23	31	15	10	18
105. Soviet Physics-Crystallography	6	0.21%	95.68%	47	23	31	16	10	18

106. Monthly Notices of the Royal Astronomical Society	6	0.21%	95.88%	47	27	33	16	10	12
107. Optik	6	0.21%	96.09%	47	25	33	16	7	17
108. Jr. of Statistical Physics	6	0.21%	96.29%	47	27	33	16	10	12
109. Letters in Mathematical Physics	5	0.17%	96.47%	48	27	33	16	10	13
110. Jr. of Physics Education	5	0.17%	96.64%	48	27	33	16	10	13
111. Jr. of American Ceramic Society	5	0.17%	96.81%	48	25	33	16	10	15
112. Proceedings of the Indian Academy of Sciences	5	0.17%	96.98%	48	25	31	15	10	18
113. Atom	5	0.17%	97.15%	48	27	29	15	10	18
114. Europhysics Letters	5	0.17%	97.32%	48	27	29	15	10	18
115. Jr. of Applied Metrology	4	0.14%	97.46%	49	27	33	16	10	14
116. IEEE transactions on Nuclear Science	4	0.14%	97.60%	49	24	33	16	10	17
117. Jr. of Colloid & Interface Science	4	0.14%	97.74%	49	23	33	16	10	18
118. Jr. of Electrochemical Society (India)	4	0.14%	97.87%	49	23	33	16	10	18
119. Jr. of Physical chemistry	4	0.14%	97.01%	49	23	33	16	10	18
120. Jr. of Crystal Growth	4	0.14%	98.15%	49	23	33	16	10	18
121. Revue De Physique Applique	3	0.10%	98.25%	50	24	33	16	10	16
122. Jr. of Geophysical Research	3	0.10%	98.35%	50	27	33	16	8	17
123. International Jr. of Modern Physics	3	0.10%	98.46%	50	27	33	16	10	18
124. Spectrochimica Acta	3	0.10%	98.56%	50	24	33	16	10	18
125. Jr. of Scientific Instruments	3	0.10%	98.66%	50	24	33	16	10	18
126. Jr. of Vacuum Science & Technology	3	0.10%	98.76%	50	24	33	16	10	18
127. Society of quantum Electronics	3	0.10%	98.87%	50	27	33	16	10	15
128. Advances in Atomic & Molecular Physics	3	0.10%	98.97%	50	26	31	16	10	18
129. IEEE Transactions on Plasma Physics	2	0.07%	99.04%	51	27	33	16	10	16
130. Astrophysics & Space Science	2	0.07%	99.11%	51	27	31	16	10	18
131. Progress in Particle & Nuclear Physics	2	0.07%	99.18%	51	27	31	14	10	18
132. Soviet Physics Acoustics	2	0.07%	99.25%	51	27	31	16	10	18
133. Plasma Physics	2	0.07%	99.31%	51	27	33	16	10	18
134. Chemical Physics	2	0.07%	99.38%	51	26	33	16	9	18
135. Jr. of Electron Spectroscopy & Related Phenomena	2	0.07%	99.45%	51	25	33	16	10	18
136. Jr. of Non-Crystalline Solids	2	0.07%	99.52%	51	25	33	16	10	18
137. Soviet Physics- USPEKHI	2	0.07%	99.59%	51	27	31	16	10	16
138. Soviet Physics-Technical Physics	2	0.07%	99.66%	51	27	33	16	10	18
139. Indian Jr. of Technology	2	0.07%	99.73%	51	25	33	16	10	18
140. Indian Jr. of Technology	1	0.03%	99.76%	52	26	33	16	10	18
141. Accounts of Chemical Research	1	0.03%	99.79%	52	26	33	16	10	18
142. IEEE Transactions on Electronic Devices	1	0.03%	99.83%	52	26	33	16	10	18
143. Acta Physica Austriaca	1	0.03%	99.86%	52	26	33	16	10	18
144. Cryogenics	1	0.03%	99.90%	52	26	33	16	10	18
145. Jr. of Molecular Spectroscopy	1	0.03%	99.93%	52	26	33	16	10	18
146. Jr. of Physics-F Metal Physics	1	0.03%	99.97%	52	26	33	16	10	18
147. International Jr. of Non-linear Mechanics	1	0.03%	100.00%	52	27	33	16	10	17

TU - Total Use; %U - Percentage Use; C%U - Cumulative Percentage Use; R (TU); CU - Citation Use; IU - In - Library Use; PU - Photocopy Use; LU - Inter Library Loan Use; AU - Assessed Use

APPENDIX 2

RANK LIST OF PERIODICALS IN PHYSICS ACCORDING TO TOTAL USE IN JNU

S. No	Title of Periodicals	TU	%U	C%U	R(TU)	Rank According to Different indicators				
						CU	IU	PU	LU	AU
1.	Science	142	13.61%	13.61%	1	14	1	1	8	6
2.	Proceedings of the National Academy of Sciences(USA)	92	8.82%	22.44%	2	14	2	1	8	6
3.	Nature	80	7.67%	30.11%	3	10	3	2	8	6
4.	Nucleic Acid research	44	4.22%	34.32%	4	14	4	7	4	6
5.	New Scientist	42	4.03%	38.35%	5	14	7	3	8	6
6.	Progress in Particle & Nuclear Physics	38	3.64%	41.99%	6	1	16	16	5	2
7.	Jr. of Mathematical Physics	35	14.36%	45.35%	7	12	16	12	1	5
8.	Jr. of Chemical Physics	34	3.26%	14.61%	8	5	8	6	8	5
9.	Physical Review Letters	34	3.26%	51.87%	8	14	5	5	7	6
10.	Progress in Theoretical Physics	34	3.26%	55.13%	8	14	6	4	8	6
11.	Jr. of Physics-A General Physics	25	2.40%	57.53%	9	2	18	18	5	4
12.	Physical Review-B Condensed Matter	25	2.40%	59.92%	9	3	16	18	5	5
13.	Proceedings of the Royal Society (London)	24	2.30%	62.22%	10	12	9	5	8	6
14.	Jr. of Crystal Growth	23	2.21%	64.43%	11	6	16	7	8	5
15.	Reviews of Modern Physics	23	2.21%	66.63%	11	11	8	9	8	6
16.	Jr. of Physics-B Atomic & Molecular	21	2.01%	68.65%	12	7	14	16	3	4
17.	Physics Today	21	2.01%	70.66%	12	13	7	14	8	6
18.	Radiation Research	18	1.73%	72.39%	13	14	10	8	8	6
19.	Jr. Scientific Instruments	17	1.63%	74.02%	14	9	16	15	2	5
20.	Physics Reports	16	1.53%	75.55%	15	13	12	13	4	6
21.	Pramana	15	1.44%	76.99%	16	14	14	10	8	3
22.	Philosophical Magazine	15	1.44%	78.43%	16	9	15	18	8	1
23.	Jr. of Physical Society of Japan	15	1.44%	79.87%	16	4	18	18	8	3
24.	Annals of Physics	15	1.44%	81.30%	16	14	10	11	8	6
25.	Zeitschrift Fuer Physik	13	1.25%	82.55%	17	14	14	12	8	3
26.	Europhysics Letters	13	1.25%	83.80%	17	14	11	14	6	6
27.	Nuclear Physics	12	1.15%	84.95%	18	14	14	12	8	4
28.	Solid State Communications	12	1.15%	86.10%	18	8	15	16	8	6
29.	Physica a : Theoretical & Statistical Physics	11	1.05%	87.15%	19	14	13	15	5	6
30.	Applied Physics Letters	11	1.05%	88.21%	19	14	12	15	8	4
31.	Soviet Physics - Solid State	11	1.05%	89.26%	19	6	18	18	8	4
32.	Jr. of Physics - C Solid State Physics	11	1.05%	90.32%	19	12	13	18	6	4
33.	Physical Review- A General Physics	10	0.96%	91.28%	20	10	17	16	6	5
34.	Jr. of Physics & Chemistry of Solids	10	0.96%	92.23%	20	5	18	18	8	6
35.	Physical Review-C Nuclear Physics	9	0.86%	93.10%	21	9	18	18	6	4
36.	Physica D : Non Linear Phenomena	8	0.77%	93.86%	22	9	18	16	8	5
37.	Chemical Physics Letter	8	0.77%	94.63%	22	12	14	16	8	6
38.	Indian Jr. of Pure & Applied Physics	6	0.58%	95.21%	23	13	15	16	8	6
39.	Acta Metallurgica	5	0.48%	95.69%	24	12	18	18	5	6
40.	Physical Review-D Particles of Fields	5	0.48%	96.16%	24	14	16	15	8	6
41.	Soviet Physics - JETP	4	0.38%	96.55%	25	14	18	18	6	4
42.	Jr. of Acoustical Society of America	4	0.38%	96.93%	25	13	18	18	6	5
43.	American Jr. Physics	4	0.38%	97.32%	25	14	18	14	8	4
44.	Advance in Nuclear Physics	3	0.29%	97.60%	26	14	17	16	8	6
45.	Review of Scientific Instruments	2	0.19%	97.79%	27	14	18	18	8	4
46.	Acta Crystallographica	2	0.19%	97.99%	27	14	18	18	8	4
47.	IEEE Jr. of Quantum Electronics	2	0.19%	98.18%	27	12	18	18	8	6

48. Japanese Jr. Applied Physics	2	0.19%	98.37%	27	12	18	18	8	6
49. Jr. of Radiation Research	2	0.19%	98.56%	27	14	16	18	8	6
50. Jr. of Magnetic Resonance	2	0.19%	98.75%	27	12	18	18	8	6
51. Acta Astronomica et Geophysica Universitatis Comenianae	2	0.19%	98.95%	27	14	17	17	8	6
52. Modern Physics Letters	1	0.10%	99.04%	28	14	18	18	8	5
53. Applied Acoustics	1	0.10%	99.14%	28	14	18	18	8	5
54. Jr. of Applied Physics	1	0.10%	99.23%	28	14	18	18	8	5
55. Advance in Physics	1	0.10%	99.33%	28	13	18	18	8	6
56. Jr. of Fluids Engineering	1	0.10%	99.42%	28	13	18	18	8	6
57. Molecular Physics	1	0.10%	99.52%	28	13	18	18	8	6
58. Computational Mechanics	1	0.10%	99.62%	28	14	18	17	8	6
59. Inorganic Chemistry	1	0.10%	99.71%	28	13	18	18	8	6
60. Optical & Quantum Electronics	1	0.10%	99.81%	28	13	18	18	8	6
61. Doklady: BioPhysics	1	0.10%	99.90%	28	13	1	18	8	6
62. Communication in Mathematical Physics	1	0.10%	100.00%	28	13	18	18	8	6

TU - Total Use; %U - Percentage Use; C%U - Cumulative Percentage Use; R (TU); CU - Citation Use; IU - In - Library Use; PU - Photocopy Use; LU - Inter Library Loan Use; AU - Assessed Use

APPENDIX 3

RANK LIST OF PERIODICALS IN CHEMISTRY ACCORDING TO TOTAL USE IN CSL (DU)

S. No	Title of Periodicals	TU	%U	C%U	R (TU)	Rank According to Different indicators				
						CU	IU	PU	LU	AU
1.	Jr. of American Chemical Society	209	9.67%	9.67%	1	1	4	1	5	1
2.	Jr. of Organic Chemistry	108	5.00%	14.67%	2	2	5	8	5	3
3.	Indian Jr. of Chemistry	78	3.61%	18.28%	3	4	11	14	7	4
4.	Jr. of Chemical Society: Chemical Communication	74	3.42%	21.70%	4	5	9	13	7	4
5.	Jr. of Physical Chemistry	73	3.38%	25.08%	5	3	7	4	7	14
6.	Tetrahedron Letters	68	3.15%	28.23%	6	8	11	14	7	2
7.	Tetrahedron	63	2.92%	31.14%	7	6	5	7	7	12
8.	Jr. of Physics-C Solid State Physics	61	2.82%	33.97%	8	15	5	2	7	6
9.	Chemical Physics Letter	59	2.73%	36.70%	9	10	2	7	5	15
10.	Chemical Reviews	45	2.08%	38.78%	10	14	3	10	7	15
11.	Jr. of Polymer Science	43	1.99%	40.77%	11	7	18	10	2	15
12.	Jr. of Indian Chemical Society	43	1.99%	42.76%	11	13	15	15	7	5
13.	Chemical Society Reviews	40	1.85%	44.61%	12	17	7	3	7	15
14.	Phytochemistry	39	1.80%	46.41%	13	15	6	14	5	9
15.	Jr. of Chemical Physics	39	1.80%	48.22%	13	6	14	16	7	12
16.	Indian Jr. of Biochemistry & Biophysics	38	1.76%	49.98%	14	22	4	8	7	15
17.	Macromolecular Chime	37	1.71%	51.69%	15	4	20	21	7	15
18.	Nature	37	1.71%	53.40%	15	13	5	15	7	14
19.	Colloids & Surface	36	1.67%	55.07%	16	22	1	14	7	15
20.	Inorganica Chi mica Acta	33	1.53%	56.59%	17	22	11	6	3	12
21.	European Jr. of Biochemistry	33	1.53%	58.12%	17	22	5	9	7	15
22.	Proceedings of the National Academy of Science	33	1.53%	59.65%	17	20	10	4	7	15
23.	Analytical Chemistry	30	1.39%	61.04%	18	17	8	17	7	8
24.	Polyhedron	30	1.30%	62.33%	19	22	11	5	7	15
25.	Jr. of Chemical Society: Faraday Transactions	26	1.20%	63.54%	20	12	11	16	7	15
26.	Proceedings of the Indian Academy Of Science	23	1.06%	64.60%	21	11	14	17	6	15
27.	Synthesis	23	1.06%	65.66%	21	13	16	19	5	9
28.	Inorganic Chemistry	21	0.97%	66.64%	22	17	18	14	7	9
29.	Talanta	21	0.97%	67.61%	22	15	18	13	4	15
30.	Bulletin of the Academy of Science of USSR Chemical Science	21	0.97%	68.58%	22	9	20	21	7	15
31.	Jr. of Inorganic & Nuclear Chemistry	20	0.93%	69.50%	23	10	20	21	7	10
32.	Bulletin of Chemical Society of Japan	18	0.83%	70.34%	24	11	20	21	2	14
33.	Surface Science	17	0.79%	71.12%	25	17	13	17	7	15
34.	Jr. of Colloid & Interface Science	17	0.79%	71.91%	25	16	20	21	1	14
35.	Bioelectrochemistry & Bioenergetics	16	0.74%	72.65%	26	22	11	16	7	16
36.	Biochemical & Biophysical Research communications	15	0.69%	73.35%	27	22	18	9	7	15
37.	Biochimica et Biophysica Acta	15	0.69%	74.73%	27	13	20	17	7	13
38.	Jr. of Medicinal Chemistry	14	0.65%	75.38%	28	18	20	13	7	14
39.	Jr. of Electrochemical Society (India)	14	0.65%	76.03%	28	18	17	19	4	13
40.	Nucleic Acid Research	13	0.60%	76.63%	29	22	17	12	7	15
41.	Biochemistry (USA)	13	0.60%	77.23%	29	15	18	17	7	15

42. Chemical Age of India	13	0.60%	77.83%	29	22	18	11	7	15
43. Jr. of Chemical Education	13	0.60%	78.44%	29	17	20	21	7	7
44. Progress in Nucleic Acid Research & Molecular Biology	12	0.56%	78.99%	30	22	17	13	7	15
45. Synthetic Methods of Organic Chemistry	11	0.51%	79.50%	31	22	12	19	7	15
46. Photochemistry & Photobiology	11	0.51%	80.01%	31	17	20	21	7	9
47. Jr. of Biological Chemistry	11	0.51%	80.52%	31	20	15	17	7	15
48. Jr. of Surface Science & Technology	11	0.51%	81.03%	31	22	16	15	7	15
49. Biochemical Genetics	10	0.46%	81.49%	32	22	14	17	7	15
50. Jr. of Scientific & Industrial Research	10	0.46%	81.95%	32	19	15	19	7	15
51. Soviet Plant Physiology	9	0.42%	82.37%	33	19	20	16	7	14
52. FEBS Letters	9	0.42%	82.79%	33	19	19	17	7	14
53. Accounts of Chemical Research	9	0.42%	83.20%	33	16	20	20	7	13
54. Organic Reactions	9	0.42%	83.62%	33	22	18	16	7	13
55. Analyst	9	0.42%	84.04%	33	19	20	16	7	14
56. Proceedings of the Indian National Science Academy	9	0.42%	84.45%	33	16	20	19	6	15
57. Macromolecules	9	0.42%	84.87%	33	22	16	16	7	15
58. Polymer (UK)	9	0.42%	85.28%	33	13	20	21	7	15
59. Chemistry Letters	9	0.42%	85.70%	33	16	20	21	4	15
60. Chemical & Pharmaceutical Bulletin	8	0.37%	86.07%	34	20	20	21	4	12
61. Jr. of Biochemistry	8	0.37%	86.44%	34	20	17	20	7	13
62. Helvetica Chimica Acta	8	0.37%	86.81%	34	14	20	21	7	15
63. Transactions Metal Chemistry	8	0.37%	87.18%	34	22	19	19	2	15
64. Acta Chemica Scandinavica	8	0.37%	87.55%	34	14	20	21	7	15
65. Progress in Nucleic Acid Research & Molecular Biology	8	0.375	87.92%	34	21	15	21	7	13
66. Jr. of Heterocyclic Chemistry	7	0.32%	88.25%	35	22	18	19	7	12
67. Jr. of Magnetic Resonance	7	0.32%	88.57%	35	22	18	19	7	12
68. Australian Jr. of Chemistry	7	0.32%	88.89%	35	19	20	21	7	11
69. Gazzetta Chimica Italiana	7	0.32%	89.22%	35	17	20	21	5	15
70. Jr. of Chemical Society: Perkin Transactions	7	0.32%	89.54%	35	18	18	20	7	15
71. Jr. of Organometallic Chemistry	7	0.32%	89.87%	35	21	20	21	7	9
72. European Polymer Jr.	6	0.28%	90.14%	36	16	20	21	7	15
73. Analytical Biochemistry	6	0.28%	90.42%	36	22	20	17	5	15
74. Fuel	6	0.28%	90.70%	36	17	20	21	7	14
75. Heterocycles	6	0.28%	90.98%	36	20	20	21	7	11
76. Jr. of Electro analytical Chemistry & Interfacial Electrochem	6	0.28%	91.25%	36	22	20	18	7	12
77. Jr. of Molecular Structure: Theochem	6	0.28%	91.53%	36	21	17	21	7	13
78. Physical Review - B Condensed Matter	6	0.28%	91.81%	36	16	20	21	7	15
79. Reviews of Modern Physics	5	0.23%	92.04%	37	17	20	21	7	15
80. Inorganic Synthesis	5	0.23%	92.27%	37	22	16	20	7	15
81. Progress in Inorganic Chemistry	5	0.23%	92.50%	37	20	20	21	4	15
82. Polymer Communication	5	0.23%	92.73%	37	17	20	21	7	15
83. Proceedings of the Indian Science congress Association	5	0.23%	92.97%	37	21	16	21	7	15
84. Natural Product Reports	5	0.23%	93.20%	37	17	20	21	7	15
85. Nuovo Cimento	5	0.23%	93.43%	37	17	20	21	7	15
86. Organic Chemistry	5	0.23%	93.66%	37	17	20	21	7	15
87. Applied Surface Science	5	0.23%	93.89%	37	20	20	18	7	15
88. Jr. of Chromatography	5	0.23%	94.12%	37	21	18	21	6	14
89. Analytica Chimica Acta	4	0.19%	94.31%	38	22	20	18	7	14
90. Jr. of Applied Physics	4	0.19%	94.49%	38	18	20	21	7	15
91. Polymer Science USSR	4	0.19%	94.68%	38	20	19	21	6	15
92. Philosophical Transactions of	4	0.19%	94.86%	38	22	20	21	3	15

Royal Society (London)									
93. Biopolymers	4	0.19%	95.05%	38	18	20	21	7	15
94. Jr. of Molecular Catalysis	4	0.19%	95.23%	38	19	20	21	7	14
95. Chemische Berichte	4	0.19%	95.42%	38	19	20	21	6	15
96. Jr. of Chemical Society: Dalton Transactions	4	0.19%	95.60%	38	18	20	21	7	15
97. Biochemical Jr.	4	0.19%	95.79%	38	21	20	20	5	15
98. Photochemistry & Photobiology	4	0.19%	95.97%	38	22	20	21	3	15
99. Chemistry International	4	0.19%	96.16%	38	22	20	21	3	15
100. Clloid & Polymer Science	3	0.14%	96.30	39	20	20	21	7	14
101. Report of the Botanical Survey of India	3	0.14%	96.44%	39	22	19	19	7	15
102. Enzyme	3	0.14%	96.58%	39	20	20	21	7	14
103. Polymer Bulletin	3	0.14%	96.71%	39	19	20	21	7	15
104. Jr. of Materials Science	3	0.14%	96.85%	39	19	20	21	7	15
105. Jr. of Inorganic Biochemistry	3	0.14%	96.99%	39	22	20	18	7	15
106. Russian Jr. of Physical Chemistry	3	0.14%	97.13%	39	22	20	21	4	15
107. Chemical Physics	3	0.14%	97.27%	39	22	20	19	6	15
108. International Jr. of Peptide & Protein Research	3	0.14%	97.41%	39	21	20	19	7	15
109. Photochemistry & Photobiology	3	0.14%	97.55%	39	22	20	19	6	15
110. Clays & Clay Minerals	2	0.09%	97.64%	40	22	20	21	7	13
111. Jr. of Magnetic Resonance	2	0.09%	97.73%	40	20	20	21	7	15
112. Biochemistry (USSR)	2	0.09%	97.83%	40	22	20	19	7	15
113. Chemistry & Industry	2	0.09%	97.92%	40	20	20	21	7	15
114. Competes Rendus de L' Acadmie des Sciences	2	0.09%	98.01%	40	20	20	21	7	15
115. Jr. of General Chemistry of USSR	2	0.09%	98.10%	40	20	20	21	7	15
116. New Phytologist	2	0.09%	98.20%	40	22	20	21	5	15
117. Soviet Electrochemistry	2	0.09%	98.29%	40	22	18	21	7	15
118. Jr. of Soil Science	2	0.09%	98.38%	40	22	20	21	7	13
119. Bioorganic & Medicinal Chemistry Letters	2	0.09%	98.47%	40	22	20	21	6	14
120. Angewandte Chemie	2	0.09%	98.57%	40	21	20	21	7	14
121. Electrochimica Acta	2	0.09%	98.66%	40	21	20	21	7	14
122. Bulletin Chemical Pharmacology Society of Japan	2	0.09%	98.75%	40	22	20	19	7	15
123. Jr. of Analytical Chemistry of USSR	2	0.09%	98.84%	40	20	20	21	7	15
124. Tetrahedron Asymmetry	1	0.05%	98.89%	41	22	20	21	7	14
125. Jr. of Pharmaceutical Science	1	0.05%	98.94%	41	21	20	21	7	15
126. International Jr. of Quantum Chemistry	1	0.05%	98.98%	41	22	20	21	7	14
127. Faraday Symposia of the Chemical Society	1	0.05%	99.03%	41	22	20	20	7	15
128. International Jr. of Applied Radiation & Isotopes	1	0.05%	99.07%	41	22	20	20	7	15
129. Materials Science & Technology	1	0.05%	99.12%	41	22	20	21	7	14
130. Advances in Organ metallic Chemistry	1	0.05%	99.17%	41	21	20	21	7	15
131. Jr. of Chemical Ecology	1	0.05%	99.21%	41	22	20	21	6	15
132. Israel Jr. of Chemistry	1	0.05%	99.26%	41	22	20	21	6	15
133. Hydrocarbon Processing	1	0.05%	99.31%	41	22	20	21	7	14
134. Jr. of Chemical Technology & Biotechnology	1	0.05%	99.35%	41	22	20	21	7	14
135. Bulletin of Materials Science	1	0.05%	99.44%	41	21	20	21	7	15
136. Review on Silicon, Germanium, Aluminum, Tin & Lead Compounds	1	0.05%	99.44%	41	21	20	21	7	14
137. Jr. of Computational Chemistry	1	0.05%	99.49%	41	22	20	21	7	14
138. Spectrochimica Acta	1	0.05%	99.54%	41	21	20	21	7	15
139. Molecular & General Genetics	1	0.05%	99.58%	41	22	20	21	6	15
140. Chemical Weekly	1	0.05%	99.63%	41	22	20	21	7	14

141. Annals de Chimie	1	0.05%	99.68%	41	21	20	21	7	15
142. Pure & Applied Chemistry	1	0.05%	99.72%	41	21	20	21	7	15
143. Protoplasma	1	0.05%	99.77%	41	22	20	21	6	15
144. Jr. of Coordination Chemistry	1	0.05%	99.81%	41	22	19	21	7	15
145. Archives of Biochemistry & Biophysics	1	0.05%	99.86%	41	21	20	21	7	15
146. Chemistry in Britain	1	0.05%	99.91%	41	22	20	21	7	14
147. Progress in Polymer Science	1	0.05%	99.95%	41	21	20	21	7	15
148. Biosensors	1	0.05%	100.00%	41	22	20	21	7	14

TU – Total Use; %U – Percentage Use; C%U – Cumulative Percentage Use; R (TU); CU – Citation Use; IU – In – Library Use; PU – Photocopy Use; LU – Inter Library Loan Use; AU – Assessed Use

APPENDIX 4

RANK LIST OF PERIODICALS IN CHEMISTRY ACCORDING TO TOTAL USE IN JNU

S. No	Title of Periodicals	TU	%U	C%U	R (TU)	Rank According to Different indicators				
						CU	IU	PU	LU	AU
1.	Cell	97	9.65%	9.65%	1	12	2	1	4	32.
2.	Science	76	7.56%	17.21%	2	7	1	5	6	4
3.	Nucleic Acid Research	65	6.47%	23.68%	3	12	4	3	3	4
4.	Jr. of Biological Chemistry	57	5.67%	29.35%	4	10	3	7	6	3
5.	Biochimica et Biophysica Acta	52	5.17%	34.53%	5	8	6	2	6	4
6.	Biochemistry (USA)	33	3.28%	37.81%	6	9	5	14	5	4
7.	Photosynthetic	31	3.08%	40.90%	7	6	9	7	6	4
8.	International Jr. of Environmental Analytical Chemistry	25	2.49%	43.38%	8	10	8	9	6	4
9.	Plant & Soil	23	2.29%	45.67%	9	11	12	6	6	4
10.	Experientia	23	2.29%	47.96%	9	9	11	8	6	4
11.	Biochemical Pharmacology	22	2.19%	50.15%	10	12	15	4	6	4
12.	Biochemical & Biophysical Research	22	2.19%	52.34%	10	7	10	16	2	4
13.	Canadian Jr. of Physics	22	2.19%	54.53%	10	1	17	14	6	4
14.	Analytical Chemistry	20	1.99%	56.52%	11	8	11	15	6	1
15.	Biochemical Pharmacology	20	1.99%	58.51%	11	12	7	16	4	4
16.	Archives of Biochemistry & Biophysics	19	1.89%	60.40%	12	7	12	12	6	4
17.	Indian Jr. of Marine Sciences	19	1.89%	62.29%	12	5	10	16	6	4
18.	Jr. of Ecology	19	1.89%	64.18%	12	3	17	15	6	4
19.	Photosynthesis Research	18	1.79%	65.97%	13	10	13	9	6	4
20.	Scientific American	18	1.79%	67.76%	13	3	19	14	6	4
21.	Nature	15	1.49%	69.25%	14	2	19	18	6	4
22.	European Jr. of Biochemistry	14	1.39%	70.65%	15	6	17	12	6	4
23.	Jr. of American Chemical Society	13	1.29%	71.94%	16	9	19	18	1	1
24.	Trends in Biochemical Sciences	12	1.19%	73.13%	17	12	10	16	6	4
25.	Science Progress	12	1.19%	74.33%	17	12	15	10	6	4
26.	Communication (ACM)	10	1.00%	75.32%	18	12	15	12	6	4
27.	Jr. of Photochemistry & Photobiology	10	1.00%	76.32%	18	12	12	16	6	4
28.	Soil Biology & Biochemistry	10	1.00%	77.31%	18	12	14	14	6	4
29.	Photochemistry & Photobiology	10	1.00%	78.31%	18	12	15	12	6	4
30.	Science Today Technology	9	0.90%	79.20%	19	8	16	17	6	3
32.	Analytical Chemistry	9	0.90%	81.00%	19	4	19	8	6	4
33.	Jr. of Applied Meteorology	9	0.90%	81.89%	19	4	19	18	6	4
34.	Indian Jr. of Biochemistry & Biophysics	9	0.90%	82.79%	19	12	15	13	6	4
35.	Chemical Geology	9	0.90%	83.68%	19	5	18	17	6	4
36.	Jr. of Electro analytical Chemistry & Interfacial Electrochem	8	0.80%	84.48%	20	12	14	15	6	4
37.	Jr. of Soil Science	8	0.80%	85.27%	20	8	19	18	3	4
38.	Progress in Biophysics & Molecular Biology	8	0.80%	86.07%	20	12	17	12	6	4
39.	Nuclear Safety	7	0.70%	86.77%	21	5	19	18	6	4
40.	Proceedings of the Indian Academy of Science	7	0.70%	87.46%	21	5	19	18	6	4

41. Jr. of Hydrology	7	0.70%	88.16%	21	5	19	18	6	4
42. Critical Reviews in Biochemistry	7	0.70%	88.86%	21	12	16	14	6	4
43. Chemical & Engineering News	6	0.60%	89.45%	22	12	17	14	6	4
44. FEBS Letters	5	0.50%	89.95%	23	7	19	18	6	4
45. Jr. of Neurochemistry	5	0.50%	90.45%	23	7	19	18	6	4
46. Earth & Planetary Science Letters	5	0.50%	90.95%	23	7	19	18	6	4
47. Photochemistry	5	0.50%	91.44%	23	11	18	15	6	4
48. Chemical Physics Letters	5	0.50%	91.94%	23	12	17	15	6	4
49. Current Science	5	0.50%	92.44%	23	7	19	18	6	4
50. Soil Biology & Biochemistry	4	0.40%	92.84%	24	8	19	18	6	4
51. Biochemistry International	4	0.40%	93.83%	24	18	18	18	6	4
52. Analytical Biochemistry	4	0.40%	94.03%	24	12	17	17	5	4
53. International Jr. of Biochemistry	3	0.30%	94.33%	25	12	17	17	6	4
54. Chemistry & Industry	3	0.30%	94.63%	25	12	17	18	5	4
55. Indian Jr. of Hydrology	3	0.30%	94.93%	25	9	19	18	6	4
56. Geochimica et Cosmochimica Acta	3	0.30%	95.22%	25	9	19	18	6	4
57. Geoderma	2	0.20%	95.42%	26	10	19	18	6	4
58. Jr. of Indian Chemical Society	2	0.20%	95.62%	26	10	19	18	6	4
59. Sedimentology	2	0.20%	95.82%	26	10	19	18	6	4
60. Indian Jr. of Earth Science	2	0.20%	96.02%	26	10	19	18	6	4
61. Fuel	2	0.20%	96.22%	26	10	19	18	6	4
62. Enzyme & Microbial Technology	2	0.20%	96.42%	26	12	18	17	6	4
63. Polyhedron	2	0.20%	96.62%	26	11	18	19	6	3
64. Proceedings of the National Academy of Science	2	0.20%	96.82%	26	10	19	18	6	4
65. Jr. of Radio, Analytical & Nuclear Chemistry	2	0.20%	97.01%	26	12	19	16	6	4
66. Jr. of organometallic Chemistry	2	0.20%	97.21%	26	12	19	18	6	2
67. Jr. of Chemical Physics	2	0.20%	97.41%	26	12	19	18	6	2
68. Jr. of Chemical Society: Chemical Communications	2	0.20%	97.61%	26	12	19	18	6	2
69. Indian Jr. of Chemistry	2	0.20%	97.81%	26	12	19	18	6	2
70. Chemistry International	1	0.10%	97.91%	27	12	19	18	6	3
71. Mausum	1	0.10%	98.01%	27	11	19	18	6	4
72. Jr. of Chromatography	1	0.10%	98.11%	27	12	19	18	6	3
73. Molecular Physics	1	0.10%	98.21%	27	12	19	18	6	3
74. Canadian Jr. of Chemistry	1	0.10%	98.31%	27	12	19	18	6	3
75. Environmental Research	1	0.10%	98.41%	27	12	19	18	6	3
76. Bioelectromagnetics	1	0.10%	98.51%	27	12	19	18	6	3
77. Soil Science Society of America Jr.	1	0.10%	98.61%	27	12	19	18	5	4
78. Indian Jr. of Ecology	1	0.10%	98.71%	27	11	19	18	5	4
79. Pramana	1	0.10%	98.81%	27	11	19	18	6	4
80. Water, Air & Soil Pollution	1	0.10%	98.91%	27	11	19	18	6	4
81. Jr. of Chemical Education	1	0.10%	99.00%	27	12	19	18	6	3
82. Physics of Fluids	1	0.10%	99.10%	27	12	19	17	6	4
83. Talanta	1	0.10%	99.20%	27	12	19	18	6	3
84. Jr. of Indian Society of Soil Science	1	0.10%	99.30%	27	12	18	18	6	4
85. Soil Science & plant Nutrition	1	0.10%	99.40%	27	11	19	18	6	4
86. National Academy of Sciences Letters	1	0.10%	99.50%	27	11	19	18	6	4
87. Photochemistry	1	0.10%	99.60%	27	11	19	18	6	4
88. Jr. of Water Research Bulletin	1	0.10%	99.70%	27	12	19	18	6	3
89. Mausum	1	0.10%	99.80%	27	12	19	18	6	3
90. Ultrasonics	1	0.10%	99.90%	27	12	19	18	6	3
91. Physical Review Letters	1	0.10%	100.00%	27	11	19	18	6	4

TU - Total Use; %U - Percentage Use; C%U - Cumulative Percentage Use; R (TU); CU - Citation Use; IU - In - Library Use; PU - Photocopy Use; LU - Inter Library Loan Use; AU - Assessed Use

APPENDIX 5

RANK LIST OF PERIODICALS IN MATH'S ACCORDING TO TOTAL USE IN CSL(DU)

S.No	Title of Periodicals	TU	%U	C%U	R (TU)	Rank According to Different indicators				
						CU	IU	PU	LU	AU
1	Computing Review	122	4.66%	4.66%	1	11	1	13	6	1
2	Operating Systems Review	112	4.27%	8.93%	2	2	2	4	3	5
3	Abstracts of Bulgarian Scientific Literature	96	3.66%	12.60%	3	3	5	3	3	15
4	Annals of Probability	89	3.40%	15.99	4	6	6	9	6	3
5	Acta Arithmetica	72	2.75%	18.74%	5	15	23	1	6	4
6	Annals of Mathematics Studies	70	2.67%	21.41%	6	14	3	14	4	9
7	Communications in Algebra	66	2.52%	23.93%	7	8	4	13	6	16
8	Bulletin of Number Theory and Related Topics	64	2.44%	26.37%	8	20	2	5	6	17
9	Communications in Partial Differential Equations	64	2.44%	28.82%	8	8	14	2	6	21
10	Annals of Pure and Applied Logic	57	2.18%	30.99%	9	5	9	21	6	12
11	Bulletin de la Societe Mathematique de France	56	2.14%	33.13%	10	16	6	7	6	19
12	Journal of the London Mathematical Society	56	2.14%	35.27%	10	16	6	7	6	19
13	London Mathematical Society: Monographs	50	1.91%	37.18%	11	11	8	13	6	19
14	London Mathematical Society: Newsletter	50	1.91%	39.08%	11	16	14	14	6	6
15	Mathematica	48	1.83%	40.92%	12	4	25	11	6	11
16	Mathematical Gazette	45	1.72%	42.63%	13	18	18	19	6	2
17	Annual Review of Computer Science	41	1.56%	44.20%	14	7	14	16	4	20
18	Applications of Mathematics	40	1.53%	45.73%	15	11	15	12	5	19
19	Journal of the Mathematical Society of Japan	35	1.34%	47.06%	16	11	21	8	6	21
20	Journal of the Operational Research Society	34	1.30%	48.36%	17	13	29	24	6	2
21	Kodai Mathematical Journal	32	1.22%	49.58%	18	1	29	24	6	14
22	Linear Algebra and its Applications	31	1.18%	50.76%	19	20	19	6	6	20
23	London Mathematical Society: Lecture Notes series	31	1.18%	51.95%	19	11	25	17	6	10
24	S I A M Review	30	1.15%	53.09%	20	20	7	24	6	21
25	Yugoslav Journal of Operations Research	28	1.07%	54.16%	21	20	21	9	6	18
26	Zastosowania Matematyki	28	1.07%	55.23%	21	17	11	21	6	21
27	Sankhya Series B	27	1.03%	56.26%	22	20	10	22	6	19
28	Science of Computer Programming	27	1.03%	57.29%	22	17	25	15	5	11
29	Sequential Analysis	26	0.99%	58.28%	23	20	12	19	6	21
30	Topology	25	0.95%	59.24%	24	20	17	15	6	17
31	South African Journal of Science	25	0.95%	60.19%	24	20	11	24	5	19
32	Russian Academy of Sciences: Doklady	25	0.95%	61.15%	24	20	16	14	6	21
33	Statistica	24	0.92%	62.06%	25	20	18	19	6	13
34	Statistical Science	24	0.92%	62.98%	25	15	29	24	5	7

35	Results in mathematics	23	0.88%	63.85%	26	20	25	9	4	21
36	Sankhya: Series A	22	0.84%	64.69%	27	20	20	22	6	10
37	Russian Mathematical Surveys	22	0.84%	65.53%	27	20	24	10	6	19
38	Applied Mathematics and Optimization	21	0.80%	66.34%	28	20	29	24	6	5
39	Applied Mechanics Reviews	21	0.80%	67.14%	28	20	13	20	6	21
40	Astronomical Almanac	21	0.80%	67.94%	28	5	27	24	6	21
41	Indiana University: Mathematics journal	20	0.76%	68.70%	29	19	24	12	6	21
42	Institute of Mathematical Statistics: Bulletin	20	0.76%	69.47%	29	9	29	24	6	12
43	Australian Journal of Statistics	20	0.76%	70.23%	29	9	29	24	6	12
44	Biometrics	19	0.73%	70.95%	30	9	29	16	6	21
45	Bulletin of the Calcutta Mathematical Society	19	0.73%	71.68%	30	18	29	24	6	8
46	Advances in Applied Probability	19	0.73%	72.40%	30	9	29	16	6	21
47	Advances in Mathematics	18	0.69%	73.09%	31	20	29	24	6	7
48	Bulletin of the London Mathematical Society	18	0.69%	73.78%	31	7	29	24	3	20
49	Canadian Journal of Mathematics	18	0.69%	74.47%	31	20	15	23	6	19
50	Bulletin of the Malaysian Mathematical Society	17	0.65%	75.11%	32	16	18	22	6	21
51	International Journal of Man-machine Studies	15	0.57%	75.69%	33	16	25	7	6	21
52	Bulletin of the Australian Mathematical Society	15	0.57%	76.26%	33	20	20	20	6	19
53	Israel Journal of Mathematics	15	0.57%	76.83%	33	20	16	23	6	21
54	James Cook: Mathematical notes	15	0.57%	77.40%	33	8	29	24	6	19
55	Journal d'Analyse Mathématique	15	0.57%	77.98%	33	18	21	22	4	20
56	Bulletin of the American Mathematical Society	15	0.57%	78.55%	33	20	20	22	5	18
57	Canadian Mathematical Bulletin	15	0.57%	79.12%	33	20	20	20	6	19
58	Chinese Journal of Mathematics	15	0.57%	79.69%	33	20	21	17	6	21
59	Communications in Pure and Applied Mathematics	14	0.53%	80.23%	34	20	19	22	4	21
60	Nagoya Mathematical Journal	14	0.53%	80.76%	34	19	26	17	4	20
61	Natural Science Report of the Ochanomisu University	14	0.53%	81.30%	34	14	22	23	6	21
62	Operations Research Letters	13	0.50%	81.79%	34	18	25	22	6	16
63	Network Computation in Neural Systems	13	0.50%	82.29%	35	19	23	23	6	15
64	Quaestiones Mathematicae	13	0.50%	82.79%	35	12	25	24	6	20
65	Quarterly Journal of Mathematics	12	0.46%	83.24%	36	10	29	24	6	19
66	Osaka Journal of Mathematics	12	0.46%	83.70%	36	20	17	24	6	21
67	Networks	11	0.42%	84.12%	37	19	19	24	6	21
68	Proceedings of Symposia in Pure Mathematics	10	0.38%	84.50%	38	20	25	18	6	21
69	Operations Research	10	0.38%	84.89%	38	11	29	24	6	20
70	American Mathematical Society: Colloquium publications	10	0.38%	85.27%	38	16	25	23	6	20
71	Communications in Statistics: Simulation and Computation	10	0.38%	85.65%	38	20	25	18	6	21
72	Current Mathematical Publications	10	0.38%	86.03%	38	20	20	23	6	21
73	Journal of Mathematical and Physical Sciences	10	0.38%	86.41%	38	20	20	23	6	21
74	Czechoslovak Mathematical Journal	9	0.34%	86.76%	39	20	21	23	6	21

75	Demonstratio Mathematica	9	0.34%	87.10%	39	20	20	24	6	21
76	Discrete Mathematics	9	0.34%	87.44%	39	20	21	23	6	21
77	American Mathematical Monthly	9	0.34%	87.79%	39	16	29	24	6	16
78	Hiroshima Mathematical Journal	9	0.34%	88.13%	39	16	29	24	6	16
79	Journal of Functional Analysis	9	0.34%	88.47%	39	20	20	24	6	21
80	American Mathematical Society: Translations	9	0.34%	88.82%	39	18	25	21	6	21
81	Journal of Mathematics: Tokushima University	9	0.34%	89.16%	39	11	29	24	6	21
82	Duke Mathematical Journal	8	0.31%	89.47%	40	20	21	24	6	21
83	Educational Studies in Mathematics	8	0.31%	88.77%	40	20	23	22	6	21
84	Far East Journal of Mathematical Sciences	8	0.31%	90.08%	40	18	25	22	6	21
85	Ganita	7	0.27%	90.34%	41	20	25	24	3	21
86	Historia Mathematica	7	0.27%	90.61%	41	17	29	24	5	18
87	Annals of Statistics	7	0.27%	90.88%	41	13	29	24	6	21
88	Annals of the Institute of Statistical Mathematics	7	0.27%	91.15%	41	13	29	24	6	21
89	I M A: Journal of Applied Mathematics	7	0.27%	91.41%	41	20	24	22	6	21
90	Indian Journal of Mathematics	7	0.27%	91.68%	41	20	29	17	6	21
91	Institute of Mathematics: Polish Academy of Sciences	7	0.27%	91.95%	41	18	29	24	6	16
92	Journal de Mathematiques Pures et Appliquees	7	0.27%	92.21%	41	13	29	24	6	21
93	Journal of Algebra	6	0.30%	92.44%	42	17	29	24	4	20
94	Journal of Applied Probability	6	0.30%	92.67%	42	17	29	24	6	18
95	American Statistician	6	0.30%	92.90%	42	14	29	24	6	21
96	Analysis Mathematica	6	0.30%	93.13%	42	20	24	23	6	21
97	Annali di Matematica	5	0.19%	93.32%	43	20	27	21	6	21
98	Annals of Applied Probability	5	0.19%	93.51%	43	15	29	24	6	21
99	Journal of Applied Statistics	5	0.19%	93.70%	43	16	29	24	6	20
100	Journal of Approximation Theory	5	0.19%	93.89%	43	16	29	24	6	20
101	Journal of the American Statistical Association	5	0.19%	94.08%	43	20	29	24	1	21
102	Journal of the Association for Computing Machinery	5	0.19%	94.27%	43	20	24	24	6	21
103	Acta Mathematica Sinica	5	0.19%	94.47%	43	20	29	24	6	16
104	American Journal of Mathematics	5	0.19%	94.66%	43	20	25	23	6	21
105	Annals of Mathematics	4	0.15%	94.81%	44	16	29	24	6	21
106	Journal of the Australian Mathematical Society: Series A	4	0.15%	94.96%	44	20	25	24	6	21
107	Journal of the Australian Mathematical Society: Series B	4	0.15%	94.96%	44	20	29	24	6	17
108	Journal of the Indian Mathematical Society	4	0.15%	95.11%	44	20	29	24	2	21
109	Journal of the Indian Statistical Association	4	0.15%	95.27%	44	16	29	24	6	21
110	Journal of the Korean Mathematical Society	4	0.15%	95.42%	44	16	29	24	6	21
111	Mathematical Proceedings of the Cambridge Philosophical Society	4	0.15%	95.57%	44	20	25	24	6	21
112	Mathematical Programming	3	0.11%	95.73%	45	17	29	24	6	21
113	Advances in Mathematics Research	3	0.11%	95.84%	45	17	29	24	6	21
114	Annual Review of Fluid Mechanics	3	0.11%	95.95%	45	17	29	24	6	21
				96.07%						

115	Advances in Numerical Mathematic	3	0.11%	96.18%	45	20	29	21	6	21
116	Applied Mathematics Letters	3	0.11%	96.30%	45	17	29	24	6	21
117	Brazilian Journal of Probability and Statistics	3	0.11%	96.41%	45	17	29	24	6	21
118	Applied Mathematics Research eXpress	3	0.11%	96.53%	45	17	29	24	6	21
119	Annals of the Institute of Statistical Mathematics	3	0.11%	96.64%	45	18	29	24	5	21
120	Annals of Mathematics and Artificial Intelligence	3	0.11%	96.76%	45	20	29	24	6	18
121	Applicable Analysis	3	0.11%	96.87%	45	18	29	24	5	21
122	Applied General Topology	3	0.11%	96.98%	45	20	27	24	6	20
123	Applied Mathematics and Computation	3	0.11%	97.10%	45	18	29	24	6	20
124	Handbooks in Mathematical Finance	3	0.11%	97.21%	45	20	29	21	6	21
125	Mathematical Reviews	3	0.11%	97.33%	45	17	29	24	6	21
126	Proceedings of the Royal Irish Academy: Section A	3	0.11%	97.44%	45	18	29	24	6	20
127	Mathematical Reviews: Cumulative indexes	3	0.11%	97.56%	45	18	29	24	6	0
128	Mathematical Spectrum	3	0.11%	97.67%	45	20	26	24	6	21
129	Proceedings of the London Mathematical Society	3	0.11%	97.79%	45	20	28	22	6	21
130	Journal of the American Mathematical Society	3	0.11%	97.90%	45	20	29	21	6	21
131	Mathematical Systems Theory	2	0.08%	97.98%	46	18	29	24	6	21
132	Mathematics of Operations Research	2	0.08%	98.05%	46	20	27	24	6	21
133	Journal of Operator Theory	2	0.08%	98.13%	46	20	27	24	6	21
134	Mathematics Student	2	0.08%	98.21%	46	18	29	24	6	21
135	Mathematika	2	0.08%	98.28%	46	20	27	24	6	21
136	Mathematische Annalen	2	0.08%	98.36%	46	18	29	24	6	21
137	Memoirs of the American Mathematical Society	2	0.08%	98.44%	46	18	29	24	6	21
138	Optimization	2	0.08%	98.51%	46	18	29	24	6	21
139	Pacific Journal of Mathematics	2	0.08%	98.59%	46	18	29	24	6	21
140	Pakistan Journal of Statistics	2	0.08%	98.66%	46	18	29	24	6	21
141	Journal of Differential Equations	2	0.08%	98.74%	46	18	29	24	6	21
142	Journal of Differential Geometry	2	0.08%	98.82%	46	18	29	24	6	19
143	Mathematics Magazine	2	0.08%	98.89%	46	20	29	24	6	19
144	Journal of Natural Sciences and Mathematics	2	0.08%	98.97%	46	20	29	24	6	19
145	Proceedings of the American Mathematical Society	2	0.08%	99.05%	46	20	29	24	6	19
146	Proceedings of the Indian Academy of Sciences: A	2	0.08%	99.12%	46	20	29	24	6	19
147	Proceedings of the Institute of Statistical Mathematics	2	0.08%	99.20%	46	18	29	24	6	21
148	Proceedings of the Royal Society of Edinburgh: A	2	0.08%	99.27%	46	18	29	24	6	21
149	Proceedings of the Steklov Institute of Mathematics	1	0.04%	99.31%	47	19	29	24	6	21
150	Publications of the Mathematical Society of Japan	1	0.04%	99.35%	47	19	29	24	6	21
151	Quarterly of Applied Mathematics	1	0.04%	99.38%	47	19	29	24	6	21
152	R S A Journal	1	0.04%	99.43%	47	20	29	24	6	21
153	Research Reports	1	0.04%	99.47%	47	19	29	24	6	21
154	S I A M: Journal on Mathematical Analysis	1	0.04%	99.50%	47	19	29	24	6	21

155	SIAM Journal on Scientific and Statistical Computing	1	0.04%	99.54%	47	19	29	24	6	21
156	TRU Mathematics (Science University of Tokyo)	1	0.04%	99.58%	47	19	29	24	6	21
157	SIAM Journal of Computing	1	0.04%	99.62%	47	19	29	24	6	21
158	Statistical Theory and Method Abstracts	1	0.04%	99.66%	47	19	29	24	6	21
159	Statistics	1	0.04%	99.69%	47	19	29	24	6	21
160	Statistics and Probability Letters	1	0.04%	99.73%	47	19	29	24	6	21
161	Studies in Applied Mathematics	1	0.04%	99.77%	47	19	29	24	6	21
162	Tokyo Journal of Mathematics	1	0.04%	99.81%	47	20	29	24	5	21
163	Topology and its Applications	1	0.04%	99.85%	47	19	29	24	6	21
164	Transactions of the American Mathematical Society	1	0.04%	99.89%	47	19	29	24	6	21
165	Transactions of the Faculty of Actuaries	1	0.04%	99.92%	47	20	28	24	6	21
166	Translations of Mathematical Monographs	1	0.04%	99.96%	47	19	29	24	6	21
167	Yokohama Mathematical Journal	1	0.04%	100.00%	47	19	29	24	6	21

APPENDIX 6

RANK LIST OF PERIODICALS IN MATH'S ACCORDING TO TOTAL USE IN JNU

S. No	Title of Periodicals	TU	%U	C%U	R (TU)	Rank According to Different indicators				
						CU	IU	PU	LU	AU
1.	Journal of American Mathematical Society	128	9.10%	9.10%	1	1	4	1	8	1
2.	American Journal Mathematics	70	4.98%	14.08%	2	6	3	2	7	7
3.	Journal of London Mathematical Society	49	3.49%	17.57%	3	12	8	1	8	7
4.	Indian Journal of Mathematics	47	3.34%	20.91%	4	21	1	5	8	7
5.	Bulletin American Math Society	44	3.13%	24.04%	5	2	21	13	8	3
6.	Journal of logic & Algebraic Programming	41	2.92%	26.96%	6	21	2	6	8	7
7.	Mathematical Reviews	40	2.84%	29.80%	7	7	12	8	8	7
8.	Indian Journal of the Pure & Applied Math	33	2.35%	32.15%	8	19	7	5	8	6
9.	Proceeding of American Mathematical Society	33	2.35%	34.50%	8	21	6	5	8	7
10.	Numerical Methods for Partial Differential Equations	32	2.28%	36.77%	9	5	23	16	3	7
11.	Journals Operational Research Society	32	2.28%	39.05%	9	4	23	16	7	4
12.	Journal of Applied Statistical Science	30	2.13%	41.18%	10	7	22	8	8	7
13.	Annals of the Institute of Statistical Mathematics	29	2.06%	43.2.4%	11	3	23	16	8	7
14.	Annual Reviews fluid Mechanics	29	2.06%	45.31%	11	21	14	3	8	5
15.	Journal of Optimization Theory & Application	28	1.99%	47.30%	12	15	8	9	8	7
16.	Journal of Differential Equations	28	1.99%	49.59%	12	11	20	4	7	7
17.	Inventions Mathematics	27	1.92%	51.21%	13	5	23	16	8	7
18.	Bulletin London Math Society	26	1.85%	53.06%	14	6	23	16	8	5
19.	Quarterly or Journal Mathematics	25	1.78%	54.84%	15	7	23	16	7	4
20.	Quarterly Journal of Applied Mathematics	25	1.78%	56.61%	15	21	5	13	7	7
21.	Journal of Indian Mathematical Society	25	1.78%	58.39%	15	19	11	11	2	7
22.	Bull. Allahabad Mathematical Society	25	1.78%	60.17%	15	19	11	11	2	7
23.	Journal Des Mathematiques Pures et Appliquees	22	1.56%	61.74%	16	21	17	7	8	2
24.	Communication in Algebra	22	1.56%	63.30%	16	14	15	10	8	6
25.	Anziam Jr.(Jr. of Australian Math. Society-B)	21	1.49%	64.79%	17	21	9	9	8	7
26.	Houston Jr. of Mathematics	21	1.49%	66.29%	17	18	10	11	8	7
27.	Journal of Operator Theory	20	1.42%	67.71%	18	13	20	7	8	7
28.	Pacific Journal of Mathematics	19	1.35%	69.06%	19	21	13	7	7	7
29.	SIAM Journal of Mathematical Analysis	17	1.21%	70.27%	20	8	23	16	8	7
30.	Traps. Of American Mathematical Society	16	1.14%	71.41%	21	8	23	16	8	7
31.	Journal of Ramanujan Mathematical Societ	16	1.14%	72.55%	21	21	10	13	8	7
32.	Bull. Calcutta Mathematical Society	16	1.14%	73.68%	21	20	11	13	5	7
33.	Topology	14	1.00%	74.68%	22	19	18	12	6	7
34.	Journal of Combinatorial Theory Series - A	14	1.00%	75.68%	22	20	15	13	7	5
35.	Mathematical Programming	13	0.92%	76.60%	23	21	20	9	8	5
36.	Operation Research Letters	13	0.92%	77.52%	23	14	21	14	8	7
37.	European Journal or Operational Research	13	0.92%	78.45%	23	9	23	16	7	7
38.	Apta Mathematica (Hungarica)	12	0.85%	79.30%	24	19	16	14	8	7
39.	Archiv Der Mathematik	12	0.85%	80.16%	24	20	19	11	1	7
40.	Celestial Mechanics & Dynamical Astronomy	12	0.85%	81.01%	24	21	23	16	8	7
41.	Journal of Functional Analysis	12	0.85%	81.86%	24	18	16	14	4	7
42.	Mathematical Research Letter	12	0.85%	82.72%	24	17	20	15	8	7
43.	Journal of Mathematical Analysis Application	11	0.78%	83.50%	25	20	16	13	8	7
44.	Michigan Mathematical Journal	11	0.78%	84.28%	25	10	23	16	8	7
45.	Canadian Journal of Mathematics	10	0.71%	84.99%	26	11	23	16	8	6
46.	Duke Mathematical Journal	10	0.71%	85.70%	26	12	23	16	8	7
47.	Integral Equations & Operator Theory	10	0.71%	86.42%	26	21	16	13	8	6
48.	Fuzzy sets & System	9	0.64%	87.06%	27	13	23	16	8	7
49.	Bulletin Austrian Mathematical Society	8	0.57%	87.62%	28	21	17	14	8	7
50.	Advances in Mathematics	8	0.57%	88.19%	28	17	22	13	7	7
51.	Mathematiche Nachrichten	7	0.50%	88.69%	29	21	22	11	8	7
52.	Acta Mathematica (UPASLA)	7	0.50%	89.19%	29	21	17	15	8	7
53.	Semigroup Forum	7	0.50%	89.69%	29	14	23	16	8	7
54.	SIAM Review	7	0.50%	90.18%	29	20	18	15	8	7
55.	SIAM Journal Numerical Analysis	7	0.50%	90.68%	29	21	19	13	8	7
56.	Memories of The American Mathematical Society	6	0.43%	91.11%	30	15	23	16	8	5
57.	Operational Research	6	0.43%	91.54%	30	17	23	16	8	

58. International Journal of Management & Systems	6	0.43%	91.96%	30	18	22	14	8	7
59. OPSEARCH	5	0.36%	92.32%	31	18	23	16	8	7
60. Optimization	5	0.36%	92.67%	31	16	23	16	8	7
61. Int. Abstracts in Operation Research	5	0.36%	93.03%	31	21	19	15	8	7
62. Jr. of Quality & Reliability Management	5	0.36%	93.39%	31	18	23	16	8	7
63. Advanced in Applied Probability	4	0.28%	93.67%	32	19	23	16	8	7
64. Bulletin of Calcutta Statistical association	4	0.28%	93.95%	32	17	23	16	8	7
65. Journal of Statistical Planning and Inference	4	0.28%	94.24%	32	17	23	16	8	7
66. Statistics in Medicine	4	0.28%	94.52%	32	21	22	13	8	7
67. Journal of the American Statistical Association	3	0.21%	94.74%	33	21	21	15	8	7
68. Annals of Statistics	3	0.21%	94.95%	33	18	23	16	8	7
69. Annals of the Institute of Statistical Mathematics	3	0.21%	95.16%	33	18	23	16	8	7
70. Communication in Statistics -A	3	0.21%	95.38%	33	18	23	16	8	7
71. Journal of the Royal Statistical Society -A	3	0.21%	95.59%	33	18	23	16	8	7
72. Statistical Theory & Method Abs. (CD-ROM)	3	0.21%	95.80%	33	18	23	15	8	7
73. Aligarh Journal of Statistics	3	0.21%	96.02%	33	21	23	14	8	7
74. Stochastic Processes and their Application	3	0.21%	96.23%	33	18	23	16	8	7
75. Statistics	3	0.21%	96.44%	33	21	23	15	8	7
76. Journal of the Royal Statistical Society-B	2	0.14%	96.59%	34	21	23	16	6	7
77. Journal of Applied Statistics	2	0.14%	96.73%	34	19	23	16	8	7
78. Biometrics	2	0.14%	96.87%	34	19	23	16	8	7
79. International Statistical Review	2	0.14%	97.01%	34	19	23	16	8	7
80. Journal of of the Nonparametric Statistics	2	0.14%	97.16%	34	21	23	16	6	7
81. Journal of of the Royal Statistical Society -B	2	0.14%	97.30%	34	21	23	16	8	5
82. Journal of applied Probability	2	0.14%	97.44%	34	20	23	16	8	6
83. Biometrika	2	0.14%	97.58%	34	21	23	16	6	7
84. Biostatistics	2	0.14%	97.72%	34	20	23	16	8	6
85. Statistics & Math Probability Letters.	2	0.14%	97.80%	34	20	23	16	7	7
86. Sankhya	2	0.14%	98.01%	34	21	23	16	7	6
87. Metrika	2	0.14%	98.15%	34	19	23	16	8	7
88. Advanced Courses in Mathematics.	1	0.07%	98.22%	35	21	23	16	7	7
89. Advances in Applied Mathematics	1	0.07%	98.29%	35	20	23	16	8	7
90. Fundamenta Mathematicae.	1	0.07%	98.36%	35	20	23	16	8	7
91. Abstract and Applied Analysis.	1	0.07%	98.44%	35	20	23	16	8	7
92. The ACM Journal of Experimental Algorithmics	1	0.07%	98.51%	35	20	23	16	8	7
93. Advances and Applications in Statistics.	1	0.07%	98.58%	35	21	23	16	7	7
94. Geometric and Functional Analysis Chance. Springerl	1	0.07%	98.65%	35	20	23	16	8	7
95. Discrete Mathematics and its Applications	1	0.07%	98.72%	35	20	23	16	8	7
96. The British Journal of Mathematical and Statisticall	1	0.07%	98.79%	35	21	23	16	7	7
97. Bulletin of the Allahabad Mathematical Society	1	0.07%	98.86%	35	20	23	16	8	7
98. American Mathematical Society. Bulletin.	1	0.07%	98.93%	35	20	23	16	8	7
99. Electronic Transactions on Numerical Analysis	1	0.07%	99.00%	35	21	23	16	7	7
100. Bulletin of Economic Research	1	0.07%	99.08%	35	20	23	16	8	7
101. Bulletin of the Greek Mathematical Society	1	0.07%	99.15%	35	20	23	16	8	7
102. Calcutta Statistical Association Bulletin	1	0.07%	99.22%	35	21	23	16	7	7
103. Bulletin of the Belgian Mathematical Society	1	0.07%	99.29%	35	21	23	16	8	6
104. Cambridge Studies in Advanced Mathematics	1	0.07%	99.36%	35	21	23	16	8	6
105. Applied Numerical Mathematics An IMACS Journal l	1	0.07%	99.43%	35	20	23	16	8	7
106. Bulletin of the Brazilian Mathematical Society	1	0.07%	99.50%	35	20	23	16	8	7
107. Cambridge Astrophysics Series	1	0.07%	99.57%	35	20	23	16	8	7
108. Graduate Texts in Mathematics	1	0.07%	99.64%	35	21	23	16	8	6
109. APPS. Applied Sciences	1	0.07%	99.72%	35	21	23	16	8	6
110. Asia-Pacific Journal of Operational Research	1	0.07%	99.79%	35	20	23	16	8	7
111. The Asian Journal of Mathematics	1	0.07%	99.86%	35	21	23	16	8	6
112. Numerical Mathematics	1	0.07%	99.93%	35	21	23	16	8	6
113. Bolyai Society Mathematical Studies	1	0.07%	100.00%	35	20	23	16	8	7

TU - Total Use; %U - Percentage Use; C%U - Cumulative Percentage Use; R (TU); CU - Citation Use; IU - In - Library Use; PU - Photocopy Use; LU - Inter Library Loan Use; AU - Assessed Use

APPENDIX 7

COMPARATIVE RANK LIST OF PERIODICALS IN PHYSICS ACCORDING TO TOTAL USE IN BOTH UNIVERSITIES LIBRARY UNDER STUDY

S. No	Title of Periodicals	CSL(DU)	JNU
1.	Accounts of Chemical Research	52	
2.	Acta Astronomica et Geophysica Universitatis Comenianae		27
3.	Acta Crystallographica	13	
4.	Acta Crystallographica		27
5.	Acta Metallurgica		24
6.	Acta Physica Austriaca	52	
7.	Acta Physica et Chemica	45	
8.	Acoustic	10	
9.	Advance in Nuclear Physics		26
10.	Advance in Physics		28
11.	Advances in Atomic & Molecular Physics	50	
12.	Advances in Electronics & Electron Physics	34	
13.	Advances in Nuclear Physics	38	
14.	Advances in Physics	37	
15.	American Jr. of Physics	14	
16.	American Jr. Physics		25
17.	Analytical Chemistry	45	
18.	Annals of Physics		16
19.	Annals of Physics	21	
20.	Applied Acoustics		28
21.	Applied Physical Letters	2	
22.	Applied Physics Letters		19
23.	Applied Spectroscopy	44	
24.	Applied Surface Science	46	
25.	Astronomy and Astrophysics	44	
26.	Astrophysical Jr.	42	
27.	Astrophysical Jr.	40	
28.	Astrophysics & Space Science	51	
29.	Atom	48	
30.	Australian Jr. of Physics	34	
31.	Canadian Jr. of Physics	35	
32.	Chemical Physics Letter		22
33.	Chemical Physics Letter	15	
34.	Chemical Physics	51	
35.	Classical & Quantum Gravity	46	
36.	Comments on Nuclear & Particle Physics	39	
37.	Comments on Plasma Physics & Controlled Physics	46	
38.	Communication in Mathematical Physics		28
39.	Communications in Mathematical Physics	45	
40.	Computational Mechanics		28
41.	Cryogenics	52	
42.	Current Papers in Physics	32	
43.	Current Science	21	
44.	Doklady: Biophysics		28
45.	Europhysics Letters		17
46.	Ferroelectrics	45	
47.	Helvetica Physica Acta	41	
48.	IEEE Jr. of Quantum Electronics		27
49.	IEEE Transactions on Electronic Devices	52	
50.	IEEE transactions on Magnetism	42	
51.	IEEE transactions on Nuclear Science	49	
52.	IEEE Transactions on Plasma Physics	51	
53.	Indian Jr. of Physics	11	
54.	Indian Jr. of Pure & Applied Physics		23
55.	Indian Jr. of Pure & Applied Physics	10	

56. Indian Jr. of Technology	51	
57. Indian Jr. of Technology	52	
58. Inorganic Chemistry		28
59. International Jr. of Modern Physics	50	
60. International Jr. of Non-linear Mechanics	52	
61. Japanese Jr. Applied Physics		27
62. Japanese Jr. of Applied Physics	16	
63. JEPT Letters	41	
64. Jr. Mathematical Physics	41	
65. Jr. of Acoustical Society of America	11	
66. Jr. of Acoustical Society of America		25
67. Jr. of American Ceramic Society	48	
68. Jr. of American Chemical Society	45	
69. Jr. of Applied Metrology	49	
70. Jr. of Applied Physics		28
71. Jr. of Applied Physics	9	
72. Jr. of Atmospheric & Terrestrial Physics	42	
73. Jr. of Chemical Physics		8
74. Jr. of Chemical Physics	46	
75. Jr. of Colloid & Interface Science	49	
76. Jr. of Crystal Growth		11
77. Jr. of Crystal Growth	49	
78. Jr. of Electrochemical Society (India)	49	
79. Jr. of Electron Spectroscopy & Related Phenomena	51	
80. Jr. of Fluid Mechanics	37	
81. Jr. of Fluids Engineering		28
82. Jr. of Geophysical Research	50	
83. Jr. of Low Temperature Physics	41	
84. Jr. of Magnetic Resonance		27
85. Jr. of Magnetic Resonance	43	
86. Jr. of Materials Research	45	
87. Jr. of Mathematical Physics		7
88. Jr. of Molecular Spectroscopy	52	
89. Jr. of Non-Crystalline Solids	51	
90. Jr. of Optical Society of America	34	
91. Jr. of Plasma Physics	45	
92. Jr. of Physical chemistry	49	
93. Jr. of Physical Society of Japan		16
94. Jr. of Physical Society of Japan	25	
95. Jr. of Physics - B Atomic & Molecular	24	
96. Jr. of Physics - C Solid State Physics		19
97. Jr. of Physics & Applied Physics	28	
98. Jr. of Physics & Chemistry of Solids		20
99. Jr. of Physics & Chemistry of Solids	43	
100. Jr. of Physics Education	48	
101. Jr. of Physics - G Nuclear Physics	27	
102. Jr. of Physics-A General Physics		9
103. Jr. of Physics-A General Physics	8	
104. Jr. of Physics-B Atomic & Molecular		12
105. Jr. of Physics-C Solid State Physics	33	
106. Jr. of Physics-F Metal Physics	52	
107. Jr. of Radiation Research		27
108. Jr. of Scientific Instruments	50	
109. Jr. of Statistical Physics	47	
110. Jr. of Vacuum Science & Technology	50	
111. Jr. Scientific Instruments		14
112. Letters in Mathematical Physics	48	
113. Microwave Jr.	46	
114. Modern Physics Letters		28
115. Modern Physics Letters	27	
116. Molecular Physics		28
117. Molecular Physics	43	

118. Monthly Notices of the Royal Astronomical Society	47	
119. Nature		3
120. Nature	7	
121. New Scientist		5
122. New Scientist	45	
123. Nuclear Data Sheets	29	
124. Nuclear Instruments & Methods	39	
125. Nuclear Physics		18
126. Nuclear Physics	37	
127. Nucleic Acid research		4
128. Nucleic Acid Research	22	
129. Nuovo Cimento	32	
130. Optical & Quantum Electronics		28
131. Optics & Spectroscopy	43	
132. Optics Communication	31	
133. Optik	47	
134. Philosophical Magazine		16
135. Philosophical Magazine	44	
136. Physica a : Theoretical & Statistical Physics		19
137. Physica A: Theoretical & Statistical Physics	35	
138. Physica C : Atomic Molecules & Plasma Physics 30		22
139. Physica D : Non Linear Phenomena		
140. Physica D: Nonlinear Phenomena	43	
141. Physica: Status Solidi	12	
142. Physica-B: Low Temperature & Solid State Physics	19	
143. Physical Letters	3	
144. Physical Review - B	5	
145. Physical Review - D	4	
146. Physical Review- A General Physics		20
147. Physical Review Letter	1	
148. Physical Review Letters		8
149. Physical Review-A General Physics	18	
150. Physical Review-B Condensed Matter		9
151. Physical Review-C Nuclear Physics		21
152. Physical Review-C Nuclear Physics	8	
153. Physical Review-D Particles of Fields		24
154. Physics News	38	
155. Physics of Fluids	20	
156. Physics Reports		15
157. Physics Reports	26	
158. Physics Today		12
159. Physics Today	24	
160. Planetary & Space Science	46	
161. Plasma Physics	51	
162. Pramana		16
163. Pramana	18	
164. Proceedings of National Academy of Sciences (USA)	35	
165. Proceedings of the Indian Academy of Sciences	48	
166. Proceedings of the National Academy of Sciences(USA)		2
167. Proceedings of the Royal Society (London)		10
168. Proceedings of the Royal Society (London)	30	
169. Progress in Particle & Nuclear Physics		6
170. Progress in Particle & Nuclear Physics	51	
171. Progress in Theoretical Physics		8
172. Progress in Theoretical Physics	32	
173. Radiation Research		13
174. Report of Mathematical Physics	45	
175. Report on Progress Physics	46	
176. Review of Scientific Instruments		27
177. Review of Scientific Instruments	43	
178. Reviews of Modern Physics		11

179. Reviews of Modern Physics	6	
180. Revue De Physique Applique	50	
181. Science		1
182. Science	12	
183. Society of quantum Electronics	50	
184. Solar Energy	36	
185. Solar Physics	37	
186. Solid State Communications		18
187. Solid State Communications	17	
188. Solid State Electronics	35	
189. Solid State Physics	44	
190. Soviet Jr. of Low Temperature Physics	32	
191. Soviet Jr. of Nuclear Physics	23	
192. Soviet Jr. of Plasma Physics	46	
193. Soviet Physics - JETP		25
194. Soviet Physics - Solid State		19
195. Soviet Physics Acoustics	51	
196. Soviet Physics- USPEKHI	51	
197. Soviet Physics-Crystallography	47	
198. Soviet Physics-JETP	34	
199. Soviet Physics-Semi Conductors	34	
200. Soviet Physics-Solid State	35	
201. Soviet Physics-Technical Physics	51	
202. Spectrochimica Acta	50	
203. Superconductor Science & Technology	46	
204. Thin Solid Films	37	
205. Zeitschrift fuer Physik		17
206. Zeitschrift fuer Physik	45	
207. Zeitschrift fuer Physik	45	
208. Zeitschrift fuer Physik	46	

APPENDIX 8

COMPARATIVE RANK LIST OF PERIODICALS IN CHEMISTRY ACCORDING TO
TOTAL USE IN BOTH UNIVERSITIES LIBRARY UNDER STUDY

S. No	Title of Periodicals	CSL(DU)	JNU
1.	Accounts of Chemical Research	33	
2.	Acta Chemica Scandinavica	34	
3.	Advances in Organometallic Chemistry	41	
4.	Analyst	33	
5.	Analytica Chimica Acta	38	
6.	Analytical Biochemistry		24
7.	Analytical Biochemistry	36	
8.	Analytical Chemistry		11
9.	Analytical Chemistry		19
10.	Analytical Chemistry	18	
11.	Angewandte Chemie	40	
12.	Annals de Chimie	41	
13.	Applied Surface Science	37	
14.	Archives of Biochemistry & Biophysics		12
15.	Archives of Biochemistry & Biophysics	41	
16.	Australian Jr. of Chemistry	35	
17.	Biochemical & Biophysical Research communications	27	
18.	Biochemical & Biophysical Research		10
19.	Biochemical Genetics	32	
20.	Biochemical Jr.	38	
21.	Biochemical Pharmacology		10
22.	Biochemical Pharmacology		11
23.	Biochemistry (USA)		6
24.	Biochemistry (USA)	29	
25.	Biochemistry (USSR)	40	
26.	Biochemistry International		24
27.	Biochimica et Biophysica Acta		5
28.	Biochimica et Biophysica Acta	27	
29.	Bioelectrochemistry & Bioenergetics	26	
30.	Bioelectromagnetics		27
31.	Bioorganic & Medicinal Chemistry Letters	40	
32.	Biopolymers	38	
33.	Biosensors	41	
34.	Bulletin Chemical Pharmacology Society of Japan	40	
35.	Bulletin of Chemical Society of Japan	24	
36.	Bulletin of Materials Science	41	
37.	Bulletin of the Academy of Science of USSR Chemical Science	22	
38.	Canadian Jr. of Chemistry		27
39.	Canadian Jr. of Physics		10
40.	Cell		1
41.	Chemical & Engineering News		22
42.	Chemical & Pharmaceutical Bulletin	34	
43.	Chemical Age of India	29	
44.	Chemical Geology		19
45.	Chemical Physics Letter	9	
46.	Chemical Physics Letters		23
47.	Chemical Physics	39	
48.	Chemical Reviews	10	
49.	Chemical Society Reviews	12	
50.	Chemical Weekly	41	
51.	Chemische Berichte	38	
52.	Chemistry & Industry		25
53.	Chemistry & Industry	40	
54.	Chemistry in Britain	41	
55.	Chemistry International		27

56. Chemistry International	38	
57. Chemistry Letters	33	
58. Clays & Clay Minerals	40	
60. Colloid & Polymer Science	39	
61. Colloids & Surface	16	
62. Communication (ACM)		
63. Comptes Rendus de L' Acadmie des Sciences	40	18
64. Critical Reviews in Biochemistry		21
65. Current Science		23
66. Earth & Planetary Science Letters		23
67. Electrochimica Acta	40	
68. Environmental Research		27
69. Enzyme & Microbial Technology		26
70. Enzyme	39	
71. European Jr. of Biochemistry		15
72. European Jr. of Biochemistry	17	
73. European Polymer Jr.	36	
74. Experientia		9
75. Faraday Symposia of the Chemical Society	41	
76. FEBS Letters		23
77. FEBS Letters	33	
78. Fuel		26
79. Fuel	36	
80. Gazzetta Chimica Italiana	35	
81. Geochimica et Cosmochimica Acta		25
82. Geoderma		26
83. Helvetica Chimica Acta	34	
84. Heterocycles	36	
85. Hydrocarbon Processing	41	
86. Indian Jr. of Biochemistry & Biophysics		19
87. Indian Jr. of Biochemistry & Biophysics	14	
88. Indian Jr. of Chemistry		26
89. Indian Jr. of Chemistry	3	
90. Indian Jr. of Earth Science		26
91. Indian Jr. of Ecology		27
92. Indian Jr. of Hydrology		25
93. Indian Jr. of Marine Sciences		12
94. Inorganic Chemistry	22	
95. Inorganic Synthesis	37	
96. Inorganica Chimica Acta	17	
97. International Jr. of Applied Radiation & Isotopes	41	
98. International Jr. of Biochemistry		25
99. International Jr. of Environmental Analytical Chemistry		8
100. International Jr. of Peptide & Protein Research	39	
101. International Jr. of Quantum Chemistry	41	
102. Israel Jr. of Chemistry	41	
103. Jr. of American Chemical Society	1	
104. Jr. of American Chemical Society		16
105. Jr. of Analytical Chemistry of USSR	40	
106. Jr. of Applied Meteorology		19
107. Jr. of Applied Physics	38	
108. Jr. of Biochemistry	34	
109. Jr. of Biological Chemistry		4
110. Jr. of Biological Chemistry	31	
111. Jr. of Chemical Ecology	41	
112. Jr. of Chemical Education		27
113. Jr. of Chemical Education	29	
114. Jr. of Chemical Physics		26
115. Jr. of Chemical Physics	13	
116. Jr. of Chemical Society: Chemical Communication	4	
117. Jr. of Chemical Society: Chemical Communications		26
118. Jr. of Chemical Society: Dalton Transactions	38	

119.Jr. of Chemical Society: Faraday Transactions	20	
120.Jr. of Chemical Society: Perkin Transactions	35	
121.Jr. of Chemical Technology & Biotechnology	41	
122.Jr. of Chromatography		27
123.Jr. of Chromatography	37	
124.Jr. of Colloid & Interface Science	25	
125.Jr. of Computational Chemistry	41	
126.Jr. of Coordination Chemistry	41	
127.Jr. of Ecology		12
128.Jr. of Electro analytical Chemistry & Interfacial Electrochem		20
129.Jr. of Electro analytical Chemistry & Interfacial Electrochem	36	
130.Jr. of Electrochemical Society (India)	28	
131.Jr. of General Chemistry of USSR	40	
132.Jr. of Heterocyclic Chemistry	35	
133.Jr. of Hydrology		21
134.Jr. of Indian Chemical Society		26
135.Jr. of Indian Chemical Society	11	
136.Jr. of Indian Society of Soil Science		27
137.Jr. of Inorganic & Nuclear Chemistry	23	
138.Jr. of Inorganic Biochemistry	39	
139.Jr. of Magnetic Resonance	35	
140.Jr. of Magnetic Resonance	40	
141.Jr. of Materials Science	39	
142.Jr. of Medicinal Chemistry	28	
143.Jr. of Molecular Catalysis	38	
144.Jr. of Molecular Structure: Theochem	36	
145.Jr. of Neurochemistry		23
146.Jr. of Organic Chemistry	2	
147.Jr. of organometallic Chemistry		26
148.Jr. of Organometallic Chemistry	35	
149.Jr. of Pharmaceutical Science	41	
150.Jr. of Photochemistry & Photobiology		18
151.Jr. of Physical Chemistry	5	
152.Jr. of Physics-C Solid State Physics	8	
153.Jr. of Polymer Science	11	
154.Jr. of Radio, Analytical & Nuclear Chemistry		26
155.Jr. of Scientific & Industrial Research	32	
156.Jr. of Soil Science		20
157.Jr. of Soil Science	40	
158.Jr. of Surface Science & Technology	31	
159.Jr. of Water Research Bulletin		27
160.Macromolecular Chime	15	
161.Macromolecules	33	
162.Materials Science & Technology	41	
163.Mausum		27
164.Mausum		27
165.Molecular & General Genetics	41	
166.Molecular Physics		27
167.National Academy of Sciences Letters		27
168.Natural Product Reports	37	
169.Nature		14
170.Nature	15	
171.New Phytologist	40	
172.Nuclear Safety		21
173.Nucleic Acid Research		3
174.Nucleic Acid Research	29	
175.Nuovo Cimento	37	
176.Organic Chemistry	37	
177.Organic Reactions	33	
178.Philosophical Transactions of Royal Society (London)	38	
179.Photochemistry & Photobiology		18
180.Photochemistry & Photobiology	31	

181.Photochemistry & Photobiology	38	
182.Photochemistry & Photobiology	39	
183.Photochemistry		23
184.Photochemistry		27
185.Photosynthesis Research		13
186.Photosynthetic		7
187.Physical Review – B Condensed Matter	36	
188.Physical Review Letters		27
189.Physics of Fluids		27
190.Phytochemistry	13	
191.Plant & Soil		9
192.Polyhedron		26
193.Polyhedron	19	
194.Polymer (UK)	33	
195.Polymer Bulletin	39	
196.Polymer Communication	37	
197.Polymer Science USSR	38	
198.Pramana		27
199.Proceedings of the Indian Academy Of Science	21	
200.Proceedings of the Indian National Science Academy	33	
201.Proceedings of the Indian Science congress Association	37	
202.Proceedings of the Indian Academy of Science		21
203.Proceedings of the National Academy of Science		26
204.Proceedings of the National Academy of Science	17	
205.Progress in Biophysics & Molecular Biology		20
206.Progress in Inorganic Chemistry	37	
207.Progress in Nucleic Acid Research & Molecular Biology	34	
208.Progress in Nucleic Acid Research & Molecular Biology	30	
209.Progress in Polymer Science	41	
210.Protoplasm	41	
211.Pure & Applied Chemistry	41	
212.Report of the Botanical Survey of India	39	
213.Review on Silicon, Germanium, Aluminum, Tin & Lead Compounds	41	
214.Reviews of Modern Physics	37	
215.Russian Jr. of Physical Chemistry	39	
216.Science Progress		17
217.Science Today		19
218.Science		2
219.Scientific American		13
220.Sedimentology		26
221.Soil Biology & Biochemistry		18
222.Soil Biology & Biochemistry		24
223.Soil Science & plant Nutrition		27
224.Soil Science Society of America Jr.		27
225.Soviet Electrochemistry	40	
226.Soviet Plant Physiology	33	
227.Spectrochimica Acta	41	
228.Surface Science	25	
229.Synthesis	21	
230.Synthetic Methods of Organic Chemistry	31	
231.Talanta		27
232.Talanta	22	
233.Technology		
234.Tetrahedron Asymmetry	41	
235.Tetrahedron Letters	6	
236.Tetrahedron	7	
237.Transactions Metal Chemistry	34	
238.Trends in Biochemical Sciences		17
239.Ultrasonics		27
240.Water, Air & Soil Pollution		27

APPENDIX 9
COMPARATIVE RANK LIST OF PERIODICALS IN MATH'S ACCORDING TO
TOTAL USE IN BOTH UNIVERSITIES LIBRARY UNDER STUDY

S. No.	Title of Periodicals	CSL(DU)	JNU
1.	Abstract and Applied Analysis.		1
2.	Abstracts of Bulgarian Scientific Literature	96	
3.	Acta Arithmetica	72	
4.	Acta Mathematica (UPASLA)		7
5.	Acta Mathematica Sinica	5	
6.	Advanced Courses in Mathematics.		1
7.	Advanced in Applied Probability		4
8.	Advances and Applications in Statistics.		1
9.	Advances in Applied Mathematics		1
10.	Advances in Applied Probability	19	
11.	Advances in Mathematics		8
12.	Advances in Mathematics	18	
13.	Advances in Mathematics Research	3	
14.	Advances in Numerical Mathematic	3	
15.	Aligarh Journal of Statistics		3
16.	American Journal Mathematics		70
17.	American Journal of Mathematics	5	
18.	American Mathematical Monthly	9	
19.	American Mathematical Society. Bulletin.		1
20.	American Mathematical Society: Colloquium publications	10	
21.	American Mathematical Society: Translations	9	
22.	American Statistician	6	
23.	Analysis Mathematica	6	
24.	Annali di Matematica	5	
25.	Annals of Applied Probability	5	
26.	Annals of Mathematics	4	
27.	Annals of Mathematics and Artificial Intelligence	3	
28.	Annals of Mathematics Studies	70	
29.	Annals of Probability	89	
30.	Annals of Pure and Applied Logic	57	
31.	Annals of Statistics		3
32.	Annals of Statistics	7	
33.	Annals of the Institute of Statistical Mathematics	7	
34.	Annals of the Institute of Statistical Mathematics	3	
35.	Annals of the Institute of Statistical Mathematics		29
36.	Annals of the Institute of Statistical Mathematics		3
37.	Annual Review of Computer Science	41	
38.	Annual Review of Fluid Mechanics	3	

39. Annual Reviews fluid Mechanics		29
40. Anziam Jr(Jr. of Australian Math. Society-B)		21
41. Applicable Analysis	3	
42. Applications of Mathematics	40	
43. Applied General Topology	3	
44. Applied Mathematics and Computation	3	
45. Applied Mathematics and Optimization	21	
46. Applied Mathematics Letters	3	
47. Applied Mathematics Research eXpress	3	
48. Applied Mechanics Reviews	21	
49. Applied Numerical Mathematics An IMACS Journal		1
50. APPS. Applied Sciences		1
51. Apta Mathematica (Hungarica)		12
52. Archiv Der Mathematik		12
53. Asia-Pacific Journal of Operational Research		1
54. Astronomical Almanac	21	
55. Australian Journal of Statistics	20	
56. Bilmetricka		2
57. Biometrics		2
58. Biometrics	19	
59. Biostatistics		2
60. Bolyai Society Mathematical Studies		1
61. Brazilian Journal of Probability and Statistics	3	
62. Bull. Allahabad Mathematical Society		25
63. Bull. Calcutta Mathematical Society		16
64. Bulletin American Math Society		44
65. Bulletin Austrian Mathematical Society		8
66. Bulletin de la Societe Mathematique de France	56	
67. Bulletin London Math Society		26
68. Bulletin of Calcutta Statistical association		4
69. Bulletin of Economic Research		1
70. Bulletin of Number Theory and Related Topics	64	
71. Bulletin of the Allahabad Mathematical Society		1
72. Bulletin of the American Mathematical Society	15	
73. Bulletin of the Australian Mathematical Society	15	
74. Bulletin of the Belgian Mathematical Society		1
75. Bulletin of the Brazilian Mathematical Society		1
76. Bulletin of the Calcutta Mathematical Society	19	
77. Bulletin of the Greek Mathematical Society		1
78. Bulletin of the London Mathematical Society	18	
79. Bulletin of the Malaysian Mathematical Society	17	
80. Calcutta Statistical Association Bulletin		1
81. Cambridge Astrophysics Series		1
82. Cambridge Studies in Advanced Mathematics		1
83. Canadian Journal of Mathematics	18	
84. Canadian Journal of Mathematics		10

85. Canadian Mathematical Bulletin	15	
86. Celestial Mechanics & Dynamical Astronomy		12
87. Chinese Journal of Mathematics	15	
88. Communication in Algebra		22
89. Communication in Statistics -A		3
90. Communications in Algebra	66	
91. Communications in Partial Differential Equations	64	
92. Communications in Pure and Applied Mathematics	14	
93. Communications in Statistics: Simulation and Computation	10	
94. Computing Reviews	122	
95. Current Mathematical Publications	10	
96. Czechoslovak Mathematical Journal	9	
97. Demonstratio Mathematica	9	
98. Discrete Mathematics	9	
99. Discrete Mathematics and its Applications		1
100. Duke Mathematical Journal		10
101. Duke Mathematical Journal	8	
102. Educational Studies in Mathematics	8	
103. Electronic Transactions on Numerical Analysis		1
104. European Journal of Operational Research		13
105. Far East Journal of Mathematical Sciences	8	
106. Fundamenta Mathematicae.		1
107. Fuzzy sets & System		9
108. Ganita	7	
109. Geometric and Functional Analysis Chance. Springer		1
110. Graduate Texts in Mathematics		1
111. Handbooks in Mathematical Finance	3	
112. Hiroshima Mathematical Journal	9	
113. Historia Mathematica	7	
114. Houston Jr. of Mathematics		21
115. I M A: Journal of Applied Mathematics	7	
116. Indian Journal of Mathematics		47
117. Indian Journal of Mathematics	7	
118. Indian Journal of the Pure & Applied Math		33
119. Indiana University: Mathematics journal	20	
120. Institute of Mathematical Statistics: Bulletin	20	
121. Institute of Mathematics: Polish Academy of Sciences	7	
122. Int Abstracts in Operation Research		5
123. Integral Equations & Operator Theory		10
124. International Journal of Management & Systems		6
125. International Journal of Man-machine Studies	15	
126. International Statistical Review		2
127. Inventiones Mathematicae		27
128. Israel Journal of Mathematics	15	

129. James Cook: Mathematical notes	15	
130. Journal d'Analyse Mathematique	15	
131. Journal de Mathematiques Pures et Appliquees	7	
132. Journal Des Mathematiques Pures et Appliquees		22
133. Journal of Algebra	6	
134. Journal of American Mathematical Society		128
135. Journal of applied Probability		2
136. Journal of Applied Probability	6	
137. Journal of Applied Statistical Science		30
138. Journal of Applied Statistics		2
139. Journal of Applied Statistics	5	
140. Journal of Approximation Theory	5	
141. Journal of Combinatorial Theory Series - A		14
142. Journal of Differential Equations		28
143. Journal of Differential Equations	2	
144. Journal of Differential Geometry	2	
145. Journal of Functional Analysis		12
146. Journal of Functional Analysis	9	
147. Journal of Indian Mathematical Society		25
148. Journal of logic & Algebraic Programming		41
149. Journal of London Mathematical Society		49
150. Journal of Mathematical Analysis Application		11
151. Journal of Mathematical and Physical Sciences	10	
152. Journal of Mathematics: Tokushima University	9	
153. Journal of Natural Sciences and Mathematics	2	
154. Journal of the Nonparametric Statistics		2
155. Journal of the Royal Statistical Society -B		2
156. Journal of Operator Theory		20
157. Journal of Operator Theory	2	
158. Journal of Optimization Theory & Application		28
159. Journal of Ramanujan Mathematical Societ		16
160. Journal of Statistical Planning and Inference		4
161. Journal of the American Mathematical Society	3	
162. Journal of the American Statistical Association		3
163. Journal of the American Statistical Association	5	
164. Journal of the Association for Computing Machinery	5	
165. Journal of the Australian Mathematical Society: Series A	4	
166. Journal of the Australian Mathematical Society: Series B	4	
167. Journal of the Indian Mathematical Society	4	
168. Journal of the Indian Statistical Association	4	
169. Journal of the Korean Mathematical Society	4	
170. Journal of the London Mathematical Society	56	
171. Journal of the Mathematical Society of Japan	35	
172. Journal of the Operational Research Society	34	

173	Journal of the Royal Statistical Society -A	3	
174	Journal of the Royal Statistical Society-B	2	
175	Journals Operational Research Society	32	
176	Jr. of Quality & Reliability Management	5	
177	Kodai Mathematical Journal	32	
178	Linear Algebra and its Applications	31	
179	London Mathematical Society: Lecture Notes series	31	
180	London Mathematical Society: Monographs	50	
181	London Mathematical Society: Newsletter	50	
182	Mathematica	48	
183	Mathematical Gazette	45	
184	Mathematical Proceedings of the Cambridge Philosophical Society	4	
185	Mathematical Programming	3	13
186	Mathematical Programming		12
187	Mathematical Research Letter		40
188	Mathematical Reviews		
189	Mathematical Reviews	3	
190	Mathematical Reviews: Cumulative indexes	3	
191	Mathematical Spectrum	3	
192	Mathematical Systems Theory	2	7
193	Mathematische Nachrichten		
194	Mathematics Magazine	2	
195	Mathematics of Operations Research	2	
196	Mathematics Student	2	
197	Mathematika	2	
198	Mathematische Annalen	2	
199	Memoirs of the American Mathematical Society		6
200	Memories of The American Mathematical Society		2
201	Metrika		11
202	Michigan Mathematical Journal	14	
203	Nagoya Mathematical Journal	14	
204	Natural Science Report of the Ochanomisu University	13	
205	Network Computation in Neural Systems	11	
206	Networks		1
207	Numerical Mathematics		32
208	Numerical Methods for Partial Differential Equations	112	
209	Operating Systems Review		13
210	Operation Research Letters		6
211	Operational Research	10	
212	Operations Research	13	
213	Operations Research Letters		5
214	OPSEARCH		5
215	Optimization	2	
216	Optimization		

217. Osaka Journal of Mathematics	12	
218. Pacific Journal of Mathematics		19
219. Pacific Journal of Mathematics	2	
220. Pakistan Journal of Statistics	2	
221. Proceeding of American Mathematical Society		33
222. Proceedings of Symposia in Pure Mathematics	10	
223. Proceedings of the American Mathematical Society	2	
224. Proceedings of the Indian Academy of Sciences: A	2	
225. Proceedings of the Institute of Statistical Mathematics	2	
226. Proceedings of the London Mathematical Society	3	
227. Proceedings of the Royal Irish Academy: Section A	3	
228. Proceedings of the Royal Society of Edinburgh: A	2	
229. Proceedings of the Steklov Institute of Mathematics	1	
230. Publications of the Mathematical Society of Japan	1	
231. Quaestiones Mathematicae	13	
232. Quarterly Journal of Applied Mathematics		25
233. Quarterly Journal of Mathematics	12	
234. Quarterly of Applied Mathematics	1	
235. Quarterly of Journal Mathematics		25
236. R S A Journal	1	
237. Research Reports	1	
238. Results in mathematics	23	
239. Russian Academy of Sciences : Doklady	25	
240. Russian Mathematical Surveys	22	
241. S I A M: Journal of Computing	1	
242. S I A M: Journal on Mathematical Analysis	1	
243. S I A M: Journal on Scientific and Statistical Computing	1	
244. S I A M: Review	30	2
245. Sankhya		
246. Sankhya: Series A	22	
247. Sankhya: Series B	27	
248. Science of Computer Programming	27	7
249. Semigroup Forum		
250. Sequential Analysis	26	7
251. SIAM Journal Numerical Analysis		17
252. SIAM Journal of Mathematical Analysis		7
253. SIAM Review		
254. South African Journal of Science	25	
255. Statistica	24	
256. Statistical Science		3
257. Statistical Theory & Method Abs. (CD-ROM)		
258. Statistical Theory and Method Abstracts	1	3
259. Statistics		

260	Statistics	1	
261	Statistics & Math Probability Letters		2
262	Statistics and Probability Letters	1	
263	Statistics in Medicine		4
264	Stochastic Processes and their Application		3
265	Studies in Applied Mathematics	1	
266	T R U Mathematics (Science University of Tokyo)	1	
267	The ACM Journal of Experimental Algorithmics		1
268	The Asian Journal of Mathematics		1
269	The British Journal of Mathematical and Statistical		1
270	Tokyo Journal of Mathematics	1	
271	Topology		14
272	Topology	25	
273	Topology and its Applications	1	
274	Transactions of the American Mathematical Society	1	
275	Transactions of the Faculty of Actuaries	1	
276	Translations of Mathematical Monographs	1	
277	Trans. Of American Mathematical Society		16
278	Yokohama Mathematical Journal	1	
279	Yugoslav Journal of Operations Research	28	
280	Zastosowania Matematyki	28	

APPENDIX 10

LIST OF PERIODICALS USED BY SCIENTISTS IN MORE THAN ONE SUBJECT IN BOTH UNIVERSITIES LIBRARY UNDER STUDY

S. No.	Title of Periodicals	PHYSICS	CHEMISTRY	MATHS
1.	Abstract and Applied Analysis	Yes	Yes	Yes
2.	Accounts of Chemical Research	Yes	Yes	No
3.	Acta Chemica Scandinavica	No	Yes	No
4.	Acta Crystallographica	Yes	Yes	No
5.	Acta Mathematica (UPASLA)	Yes	No	Yes
6.	Advances in Applied Mathematics	Yes	Yes	Yes
7.	American Journal Mathematics	Yes	No	Yes
8.	Analyst	Yes	Yes	Yes
9.	Analytica Chimica Acta	Yes	Yes	No
10.	Analytical Chemistry	Yes	Yes	No
11.	Applicable Analysis	Yes	Yes	Yes
12.	Applications of Mathematics	Yes	Yes	Yes
13.	Applied Mathematics and Optimization	Yes	No	Yes
14.	Applied Mathematics Letters	Yes	No	Yes
15.	Applied Mechanics Reviews	Yes	Yes	Yes
16.	Applied Physical Letters	Yes	Yes	Yes
17.	Applied Surface Science	Yes	Yes	Yes
18.	APPS. Applied Sciences	Yes	Yes	Yes
19.	Bulletin of Chemical Society of Japan	Yes	Yes	No
20.	Bulletin of Materials Science	Yes	Yes	No
21.	Cambridge Monographs on Mathematical Physics	Yes Yes	No	Yes
22.	Canadian Journal of Mathematics	Yes	No	Yes
23.	Canadian Jr. of Chemistry	Yes	Yes	No
24.	Canadian Jr. of Physics	Yes	Yes	Yes
25.	Chemical & Engineering News	Yes	Yes	No
26.	Chemical Age of India	Yes	Yes	No
27.	Chemical Physics	Yes	Yes	No
28.	Chemical Physics Letter	Yes	Yes	Yes
29.	Chemical Reviews	Yes	Yes	No
30.	Chemical Society Reviews	Yes	Yes	No
31.	Chemistry & Industry	Yes	Yes	No
32.	Colloids & Surface	Yes	Yes	Yes
33.	Communications in Pure and Applied Mathematics	Yes	No	Yes
34.	Current Science	Yes	Yes	Yes
35.	Electrochimica Acta	Yes	Yes	No
36.	Indian Journal of Mathematics	Yes	Yes	Yes
37.	Indian Journal of the Pure & Applied Math	Yes	No	Yes
38.	Indian Jr. of Chemistry	Yes	Yes	No
39.	Indian Jr. of Pure & Applied Physics	Yes	Yes	Yes
40.	Inorganic Chemistry	Yes	Yes	No
41.	Inorganic Synthesis	Yes	Yes	No
42.	Inorganica Chimica Acta	Yes	Yes	No
43.	International Journal of Man-machine Studies	Yes	No	Yes
44.	Journal Des Mathematiques Pures et Appliquees	Yes	No	Yes
45.	Journal of London Mathematical Society	Yes	No	Yes
46.	Journal of Mathematical Analysis Application	Yes	No	Yes
47.	Journal of Mathematical and Physical Sciences	Yes	No	Yes

48.	Journal of the Mathematical Society of Japan	Yes	No	Yes
49.	Jr. Mathematical Physics	Yes	No	Yes
50.	Jr. of American Ceramic Society	Yes	Yes	No
51.	Jr. of Applied Meteorology	Yes	Yes	No
52.	Jr. of Applied Physics	Yes	Yes	Yes
53.	Jr. of Chemical Physics	Yes	Yes	No
54.	Jr. of Chemical Society: Chemical Communication	Yes	Yes	No
55.	Jr. of Chemical Society: Faraday Transactions	Yes	Yes	No
56.	Jr. of Chemical Technology & Biotechnology	Yes	Yes	No
57.	Jr. of Chromatography	Yes	Yes	No
58.	Jr. of Colloid & Interface Science	Yes	Yes	No
59.	Jr. of Electrochemical Society (India)	Yes	Yes	No
60.	Jr. of Fluid Mechanics	Yes	Yes	Yes
61.	Jr. of Hydrology	Yes	No	Yes
62.	Jr. of Indian Chemical Society	Yes	Yes	No
63.	Jr. of Inorganic & Nuclear Chemistry	Yes	Yes	Yes
64.	Jr. of Magnetic Resonance	Yes	Yes	Yes
65.	Jr. of Materials Research	Yes	Yes	No
66.	Jr. of Materials Science	Yes	Yes	No
67.	Jr. of Mathematical Physics	Yes	No	Yes
68.	Jr. of Molecular Spectroscopy	Yes	No	Yes
69.	Jr. of Organic Chemistry	Yes	Yes	No
70.	Jr. of Organometallic Chemistry	Yes	Yes	No
71.	Jr. of Physical chemistry	Yes	Yes	No
72.	Jr. of Physics - C Solid State Physics	Yes	No	Yes
73.	Jr. of Physics & Chemistry of Solids	Yes	Yes	No
74.	Jr. of Physics - G Nuclear Physics	Yes	Yes	No
75.	Jr. of Physics - F Metal Physics	Yes	Yes	No
76.	Jr. of Polymer Science	Yes	Yes	No
77.	Jr. of Scientific & Industrial Research	Yes	Yes	No
78.	Jr. of Statistical Physics	Yes	Yes	Yes
79.	Letters in Mathematical Physics	Yes	No	Yes
80.	Mathematical Spectrum	Yes	No	Yes
81.	Metrika	Yes	No	Yes
82.	Molecular Physics	Yes	Yes	No
83.	National Academy of Sciences Letters	Yes	Yes	Yes
84.	New Scientist	Yes	Yes	Yes
85.	Nucleic Acid research	Yes	Yes	No
86.	Nuovo Cimento	Yes	Yes	No
87.	Philosophical Magazine	Yes	Yes	Yes
88.	Philosophical Transactions of Royal Society (London)	Yes	Yes	No
89.	Physica A: Theoretical & Statistical Physics	Yes	Yes	Yes
90.	Physical Review - B Condensed Matter	Yes	Yes	Yes
91.	Physical Review Letters	Yes	No	Yes
92.	Physical Review-A General Physics	Yes	Yes	Yes
93.	Physical Review-B Condensed Matter	Yes	Yes	No
94.	Physical Review-C Nuclear Physics	Yes	Yes	No
95.	Physical Review-D Particles of Fields	Yes	Yes	No
96.	Physics of Fluids	Yes	Yes	No
97.	Physics Today	Yes	No	Yes
98.	Pramana	Yes	Yes	Yes
99.	Proceeding of American Mathematical Society	Yes	No	Yes
100.	Proceedings of the Indian Academy of Sciences	Yes	Yes	Yes

101.	Proceedings of the Indian National Science Academy	Yes	Yes	Yes
102.	Proceedings of the Indian Science congress Association	Yes	Yes	Yes
103.	Proceedings of the National Academy of Sciences(USA)	Yes	Yes	Yes
104.	Proceedings of the Royal Society (London)	Yes	Yes	Yes
105.	Quarterly Journal of Applied Mathematics	Yes	No	Yes
106.	Radiation Research	Yes	Yes	No
107.	Report of Mathematical Physics	Yes	No	Yes
108.	Review of Scientific Instruments	Yes	Yes	No
109.	Reviews of Modern Physics	Yes	Yes	Yes
110.	Russian Jr. of Physical Chemistry	Yes	Yes	No
111.	Russian Mathematical Surveys	Yes	No	Yes
112.	Science	Yes	Yes	Yes
113.	Scientific American	Yes	Yes	No
114.	SIAM Journal of Mathematical Analysis	Yes	No	Yes
115.	Solid State Communications	Yes	Yes	No
116.	South African Journal of Science	Yes	Yes	Yes
117.	Spectrochimica Acta	Yes	Yes	No
118.	Surface Science	Yes	Yes	No
119.	Talanta	Yes	Yes	Yes
120.	Tetrahedron Letters	Yes	Yes	Yes
121.	Ultrasonics	Yes	Yes	No
122.	Zeitschrift fuer Physik	Yes	Yes	Yes

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